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THE CAUSE OF OBESITY *

L. H. NEWBURGH, M.D.

ANN ARBOR, MICH.

About a generation ago, a movement that had for its objective the demonstration that obesity was often attendant on internal disease began to be generally felt. It was pointed out that many of the most obese persons were apparently not large eaters and that when they were observed in the clinic they did not lose the expected amount of weight, even though the physician believed that he was underfeeding these patients.

About this time, von Noorden [1] demonstrated that the heat production per kilogram of body weight was definitely lower in obese than in normal persons. He took this fact to mean that the adiposity was caused by some serious abnormality of the metabolism. However, in so doing, he completely ignored the law of surface area, discovered by Rubner,[2] who, with his pupils, showed that the basal metabolism for all mammals is proportional to the area of the surface of the body. It is a simple matter to prove by recalculation of the older data and by means of a series of subsequent observations, such as have been collected by Boothby,[3] that the basal metabolism of obese persons per square meter of their body surface is also normal.

It is much more difficult to deal with the second argument, that adiposity is caused by endocrine disease in those patients who do not lose the expected amount of weight when they are put on reduction diets. It is first necessary to determine accurately how much weight should be lost under the circumstances. In order to do this it is essential (1) to know how much energy the subject receives in the diet; (2) to have absolute assurance that the subject adheres strictly to the diet, and (3) to obtain the transformation of energy for the whole period. The problem has not been studied with sufficient care in the past. Usually the report did not contain any guarantee that the subject did not obtain food in addition to the diet. But even more important was the lack of any satisfactory method for determining the total amount of energy transformed by the subject. This figure was inaccurately approximated by adding to the basal heat production a value that was thought to account for the specific dynamic action of the food and the activity throughout the twenty-four hours.

My associates and I have conducted our studies of obesity in such a way that we have been able to deal satisfactorily with each of these three problems. We have made observations on only one subject at a time, while he was confined in what is essentially a metabolism cage, so that he received only the food that we cared to give him. The special diet prepared for him was analyzed in our laboratory so that we knew precisely what he was receiving. Finally, it was necessary to measure the total heat production of the subject. We found that this information could be obtained by calculation from the insensible loss of weight.[4]

With such data at hand, it is a simple matter to calculate how much body tissue is being destroyed and to plot the loss of weight that is caused by the oxidation of this tissue. When now the course of the body weight of an obese subject who is being undernourished is compared with the loss due to destruction of body tissue, one may find that the two do not coincide. The actual weight may not decrease, even though tissue is certainly being destroyed. Chart 1 illustrates this phenomenon. Chart 2 shows that the subject may actually gain weight, even though she is being very severely underfed. But this apparent paradox is by no means characteristic of any type of obesity, since it occurs under similar circumstances when entirely normal subjects are observed, as is evident from chart 3. We have found that this phenomenon may be regularly produced by underfeeding any one in such a way that a rapid destruction of the liver glycogen is brought about.

If now the water exchange [5] is also recorded during such a period, it is found that there is a progressive retention of water by the body and that the weight added in this way conceals the loss of weight caused by the destruction of tissue (chart 4). Such observations make it clear that the course of a subject's weight cannot be used as a measure of the metabolism, as has been done in the past. A gain of weight may occur while body tissue is being consumed, solely because water is being added to the body; and weight may diminish in the face of overfeeding because a depletion of water is also taking place. It should be emphasized that this shifting back and forth of body water is merely a response of normal protoplasm to conditions that may be set up as desired by the investigator. Accordingly, the main support for the hypothesis that obesity is caused by internal disease vanishes.

About twenty years ago, Grafe thought he had discovered a quality of protoplasm that had much to do

* From the Department of Internal Medicine, University of Michigan Medical School.

* Read before the Section on Pharmacology and Therapeutics at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. von Noorden, Carl: Die Fettsucht, ed. 2, Vienna, Hölder-Pichler-Tempsky, A-G., 1910.

2. Rubner, M., cited by Lusk, Graham: Science of Nutrition, ed. 4, Philadelphia, W. B. Saunders Company, 1928, p. 40.

3. Boothby, W. M., and Sandiford, Irene: J. Biol. Chem. 54: 783 (Dec. 22) 1922.

4. It is impossible to deal briefly with the theory and technic of carrying out this method by means of which the total heat production may be determined. A full discussion is contained in the following article: Newburgh, L. H.; Wiley, F. H., and Lashmet, F. H.: A Method for the Determination of Heat Production Over Long Periods of Time, J. Clin. Investigation 10: 703 (Oct. 20) 1931.

5. A satisfactory procedure for obtaining the daily water balance has recently been described by us: Wiley, F. H., and Newburgh, L. H.: An Improved Method for the Determination of Water Balance, J. Clin. Investigation 10: 723 (Oct. 20) 1931.

with the body weight. He postulated that the oxidative rate in normal individuals was influenced by the amount of food eaten; that amounts beyond the real requirement stimulated the metabolism sufficiently to burn up the excess; that there was no normal basal metabolic rate but that the latter varied with the food. The obese individual was supposed to respond too little to this stimulus. In short, extra food did not increase the weight of normal individuals but did so in certain persons who were abnormal in the sense already described. A careful scrutiny of Grafe's work by experienced students of nutrition will convince them that Grafe made a serious mistake in all his experiments. His subjects were always severely undernourished at the beginning of the experiment and accordingly exhibited the well known depression of basal metabolism that is characteristic of undernutrition. Grafe, however, accepted that rate as normal. Recalculation of his data shows that he did not obtain any increase above the real normal as a result of overfeeding.[6] Further, it is rather disconcerting to find that his subjects, who, according to him, were responding normally to overfeeding, nevertheless made enormous gains in weight. Dr. F. H. Wiley and I have recently reinvestigated this question but have been unable to produce any increase in the fundamental rate of oxidation by massive overfeeding.

Studies such as have previously been outlined in this article have convinced us that there is only one basic cause of obesity—that it is invariably the result of overeating; expressed technically, that the available energy of the diet exceeds the transformation of energy on the part of the individual.

Why does any one eat more than he needs? Because the primitive instinct (appetite) is no longer obeyed or because it has been persistently disregarded so long that it has become dulled and notifies its host too late that the bodily needs have been satisfied. The recent studies of Harrington[7] have shown the dominant position of appetite in the establishment of body weight.

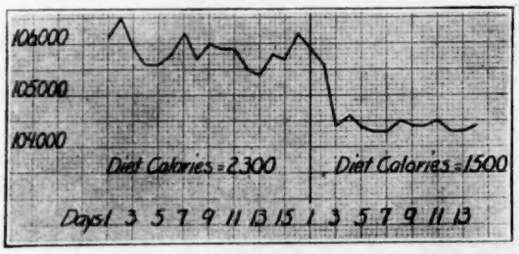

Chart 1.—It was found that 2,300 calories was required to prevent loss of weight in this obese subject. The diet was then reduced to 1,500 calories. An initial loss of weight that lasted for only two days was followed by a period of ten days during which the weight remained fixed, even though there was no lessening of the patient's activity.

Especially instructive has been her demonstration that many obese individuals exhibit emotional, unstable personalities and that they have obtained relief during periods of nervous stress by repeated nibbling of food. We have recently treated a patient of this type. She was an elderly woman who weighed 200 pounds (90.7 Kg.). With the onset of the menopause fifteen years earlier she had become nervous and irritable. For years she had munched nuts and candy as a means of controlling her irritability. Since the death of her husband two years previously, she had experienced great difficulty in sleeping at night. She had accommodated herself to this situation by reading and by eating candy, and had eaten about 2 pounds of candy weekly in this way.

Obese persons commonly tell the physician that they do not overeat. Frequently they are telling the truth as they see it, for they have made the mistake of measuring their intake of energy in terms of volume. Analysis will show that they prefer highly concentrated food, so that the amount that will distend the stomach to the point of satisfaction contains far too much energy. Miss Harrington has shown that many persons partake of food until a certain volume has been eaten, almost without regard to composition. These persons

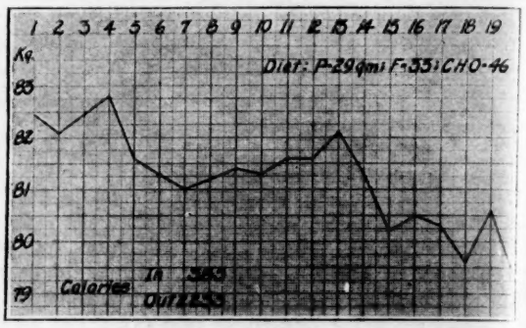

Chart 2.—In spite of rigorous underfeeding, this patient actually gained more than 2 pounds (0.9 Kg.) from the seventh to the thirteenth day.

will gain or lose weight according to the type of diet set before them, since they tend to eat the same quantity of food whether the diet contains 2 or 5 calories per gram.

Another group of patients deliberately try to deceive both the physician and themselves by insisting that they eat sparingly. Even children make this false claim, as may be seen from the following record:

Selma was a very obese high school girl of average intelligence. Her physician, who accepted her story that she never ate breakfast or lunch and that her evening meal consisted only of a small piece of fish, tomato salad, apple sauce and a glass of milk, sent her to the hospital because he suspected that the obesity was symptomatic of a brain tumor. She bore out her statement by eating so little the first week in the hospital that she lost 9 pounds (4.1 Kg.). In the meantime a dietitian had succeeded in gaining her confidence sufficiently to unearth her real food habits. Part of a typical conversation follows:

Dietitian: "What time does your family eat breakfast?"
Selma: "I guess about 7:30."
D.: "What do they usually eat?
S.: "I don't know; I never get up in time to see."
D.: "Do you mean to tell me that nothing at all is left on the table to give you any idea of what they had? Tell me, what kind of cereal do you have?"
S.: "Oh, well, they have oatmeal or corn flakes."
D.: "How do you like your eggs cooked?"
S. (squirming about): "Fried or scrambled."
D.: "Do you have oranges for breakfast?"
S.: "Yes, but I like bananas better."
D.: "Of course you have apple strudel?"
S.: "Yes, and devilsfood or butter cake. Sometimes when we run out of cake, we buy sugar biscuits. We always have rolls—I love them when they're fresh—and pumpernickel bread."
D.: "Do you have two glasses of milk?"
S.: "No, only one."
D.: "What do you eat for lunch?"
S.: "I never eat any lunch."
D.: "Even if the school cafeteria isn't kosher, you could get vegetables and bread and butter, couldn't you?"

6. Wiley, F. H., and Newburgh, L. H.: The Doubtful Nature of "Luxuskonsumtion," J. Clin. Investigation **10**: 733 (Oct. 20) 1931.
7. Harrington, Mary M.: Appetite in Relation to Weight, J. Am. Dietet. A. **6**: 101 (Sept.) 1930.

S.: "No, I don't like that, and, anyway, our lunch period is short, and it takes a long time to get all that."

D.: "But, tell me, how can you study in the afternoon without any food?"

S.: "Well, you see, during our noon period, instead of eating any lunch, I just eat candy."

D.: "And this lasts you until you get home at 3 o'clock for some more apple strudel?"

S.: "Sure, and then I drink some milk and maybe have some rolls, too."

D.: "Selma, tell me exactly what you would be having for dinner if you were home tonight. Would you have soup?"

S.: "Yes, chicken soup with rice or barley; gefilte fish cooked with carrots and celery; mashed potatoes; lettuce and tomatoes; bread with butter (three slices); apple sauce, a glass of milk, apple strudel, devilsfood or butter cake, and rice pudding."

SUMMARY

In order to study obesity satisfactorily, it was necessary to devise methods for the measurement of total heat production and of water exchange.

After an accurate record of the inflow and outflow of energy, organic solids and water had been obtained, it was found that the actual body weight always corresponded with that required by the conditions.

There is no specific metabolic abnormality in obesity. All obesity is "simple obesity." The increase in weight merely represents an inflow of energy greater than the outflow.

Failure of the primitive instinct to adjust the inflow of energy to the bodily needs is always the immediate cause of both leanness and obesity.

Geddes Road.

ABSTRACT OF DISCUSSION

DR. FRANK A. EVANS, Pittsburgh: Fluctuation in water balance is of great importance in understanding the variation in weight of patients on controlled diets. This understanding is of practical importance because many patients lose weight

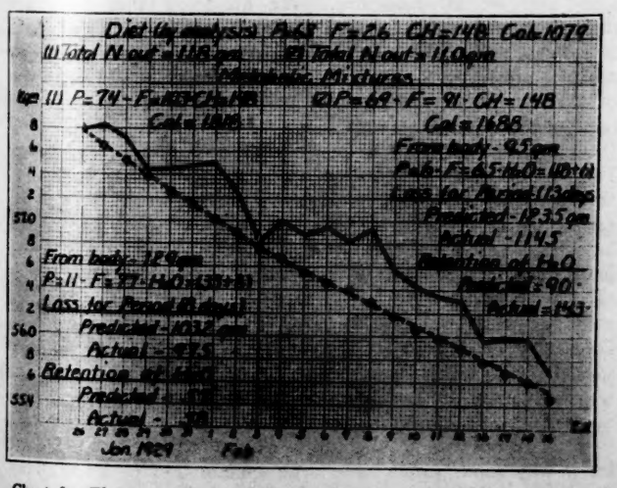

Chart 3.—The response of a normal subject to underfeeding. The solid line represents his actual body weight and the broken line what he should have weighed on account of the destruction of body tissue. The normal subject may also fail to lose weight for a number of days when undernourished. This phenomenon is caused by retention of water. When the weight of this extra water is subtracted from the recorded body weight, values are obtained, as indicated by the circles, that coincide with the predicted weight based on destruction of body tissue.

rapidly when they are not storing water, and will be discouraged when they are storing water that they are not losing weight on the same diet. In those patients who are kept in accurate balance this can definitely be shown to be a question of water balance. In the metabolic pavilion of the Western Pennsylvania Hospital, in Pittsburgh, we have had a number of patients in absolute nitrogen-carbon-oxygen balance for long periods of time. This is always possible. One patient, who was reduced 220 pounds (100 Kg.)—from 389 to 169 pounds (175.4 to 76.7 Kg.), all of it by diet alone, except 13 pounds (6 Kg.) removed surgically by a plastic operation—proved no exception to this statement. Five obese patients in the metabolic pavilion were told to eat as they chose for a week. Surreptitiously the dietitian kept account of their intake. One patient had eaten 4,500 calories a day and the others somewhat less, although in excess of normal. Yet every one of them said, when he began and at the end of the week as well, "I am not a big eater." A calory is a calory and a gram is a gram. Whatever the basic background, in all obese patients, whether the disturbance is of the so-called endocrine or of the so-called alimentary type, an energy balance can be established, and the only reason they get fat is that they overeat. Some work in our laboratory not yet published has shown that possibly satiation after food has some relation to the rate of change of elevation of calories, not the quantitative elevation, but the rate of change of calories in relation to it. Naturally then with a higher base line, as one always sees in the obese, it takes more food to get the same rate of change and therefore more food to give a feeling of satiation. Conversely, with the low basal metabolism of the undernourished, less food gives a feeling of satiation. One might postulate then that obesity at first is a habit of overeating, the overeating being primary. Later, when obesity is well established, the overeating becomes secondary to the obesity. This constitutes a vicious circle. I cannot entirely give up the idea that there is some difference in physiologic structure between those people who get fat and those who do not, or, to put it another way, in those who overeat and in those who do not. What it may be, I have no idea.

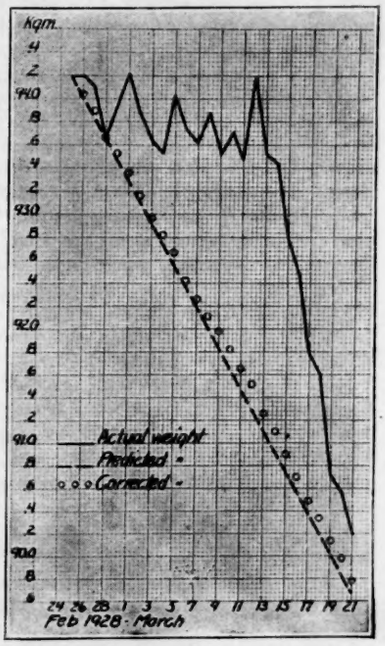

Chart 4.—The same phenomena as in chart 3, shown in an obese girl who was being underfed. She weighed as much on the sixteenth day as she did on the first day. Without change in diet or activity, she then lost weight rapidly for nine days. During the period of maintained weight, she added more than 6 pounds (2.7 Kg.) of water to her body. She lost practically all of it again in the subsequent period. The solid line indicates the actual weight; the broken line the predicted weight, and the circles the corrected weight.

DR. A. I. RUBENSTONE, Philadelphia: I am frequently assured, not only by patients but by physicians, that it is impossible for them to lose weight even though on a low calory diet. On close questioning, though there is no intent to misrepresent or withhold the truth, they actually forget about the highly caloric food that is consumed without giving it any thought. If one actually computes what the patient consumes in twenty-four hours and if the patient's memory serves him well, either he or a friend will reveal that his actual intake calorically is greater than his bodily needs for maintenance and output of energy. A husband indignantly assured me that his wife ate hardly anything at dinner, which was the only meal at which he could observe her. He also assured me that she ate even less during the day. Vindication came through a friend of hers a few days later who informed me that she consumed about half a pound of nuts and candy at a bridge game almost every afternoon. Often the physician will be puzzled by the inability to reduce his patient under strict supervision and while the patient is in bed, especially under strict supervision by hospitalization. The assumption then is that endocrine disturbance

must be at the base of this inability to lose. Sight is lost of the fact that, when the patient is put at rest or relatively so, the maintenance calories required without loss of weight are far less than when the patient is active and expending energy. The result is that though a strict diet is adhered to, no loss of weight actually occurs; sometimes there is even a slight gain, without necessarily an unusual endocrine disturbance. The treatment of obesity will produce little result unless the physician can actually get the patient to realize that there is one law of nature, and Dr. Newburgh's experiments certainly are convincing of this; namely, that what one does not put into the body in the way of calories will not increase weight and that what one does, will. Before undertaking to restrict caloric ingestion, it is well to study the patient first from a constitutional standpoint as regards his physical, cytologic, chemical and metabolic requirements and not only to suit the dietary restriction and medication to the patient but also to modify his activities in accordance with the measure obtained of the individual patient. Then one should teach the patient to make a hobby of dieting under frequent observation. Dr. Newburgh's contribution is valuable in shedding light on the temporary periods when patients cease to lose in spite of conscientious dieting. May I suggest that its practical application, furthermore, during these periods of water retention would restrict the sodium chloride intake and probably thus overcome the tendency to gain weight.

DR. M. G. WOHL, Philadelphia: I should like to ask Dr. Newburgh a question. Why is it that, in certain types of obesity, fat accumulations are located in certain parts of the body? For instance, in the eunuchoid type of individual, fat tends to accumulate in the gluteal region, hips, breasts and mons pubis. Such an individual may be made at times to lose weight on a restricted diet, yet in the locations where fat accumulates most, the fat is apt to remain. The girdle obesity of pituitary disease and Dercum's disease in which fat accumulates in isolated masses in places subject to pressure, the face and hands remaining uninvolved, are rather difficult to explain purely on the basis of energy exchange. No one denies that in obesity the law of conservation of energy is operative; but in the obese there must be a disturbance of the mechanism which enables another person to burn an excess of food and retain a stationary weight. There is some other factor, as Dr. Evans said, an unknown physiologic something, which is responsible for some cases of obesity. The experimental work of Raab, Smith and others, dealing with centers in the hypothalamus for fat metabolism, must be taken into consideration. We are all familiar with clinical instances that would seem to support the foregoing point of view. Recently two patients came to our clinic at the Temple University Hospital who gave a history of sudden gain in weight following an attack of encephalitis. The actual food intake was found to be less than the basal caloric requirement of these respective patients. Is there a disturbance in the water and salt metabolism in such patients? We too had concerned ourselves with the water and salt metabolism in obesity and approached it from another angle. I should like merely to add this: In some obese patients, as Dr. Newburgh has said, the changes in weight are due to changes in water retention. By making the McClure-Aldrich test, which consists in intracutaneous injection of 0.8 per cent solution of sodium chloride in the forearm, I found that in some obese persons who have a tendency to retain water the wheal disappeared in a short time (from five to twenty minutes). The Volhard water test has also shown water retention. Sodium chloride of the venous and capillary blood after the oral administration of 10 Gm. of sodium chloride showed a distinct difference at the end of forty-five minutes and of two hours. For instance, in one patient the difference was 100 mg. and in another 90 mg. in favor of the capillary blood two hours after the ingestion of sodium chloride. The sodium chloride must therefore have been retained in the tissues.

DR. L. G. ROWNTREE, Rochester, Minn.: I think that we ought to have a consideration of the definition of obesity. I have been interested in the question of water balance. I believe that there is more than water balance concerned. One has to consider depots and the emptying of depots and the functioning of these depots in health and disease, a question about which a great deal of information is needed. It would clarify the situation considerably if loss of weight were expressed as fresh loss and water loss. This might help one to understood a little bit about the depots. I was interested in the last statement about the use of mersalyl, because I am using the same treatment at the present time. There is infinitely more water in these patients than I would believe, judging by what one can get out with mersalyl.

DR. EMIL BOGEN, Los Angeles: I wish to inquire whether Dr. Newburgh felt that the increased appetite in the patients was purely a matter of education and perverted habit, or whether local solution or physiologic or other factors might produce increased appetite which should be combated by physiologic rather than psychologic means.

DR. L. H. NEWBURGH, Ann Arbor, Mich.: We are beyond the search for a metabolic fault as the cause of obesity. We are now thinking of the condition as related to two fundamental features of humanity. One is the personality, or the mental type, of the individual; and the other is that condition which determines his shape. I tried to emphasize how wrong we all have been in the past when we thought of the obese person as a jovial, happy-go-lucky individual who simply enjoys his food and becomes a little overweight. Of course, there are people of that sort, but that isn't the problem. Many of the really obese are just the opposite. They are hyperemotional; they suffer from insomnia; and they use food, as I said before, as we use cigarets or as some people use alcohol. Many of these people have a passion for food which is as deep, I think, as it is in the chronic alcoholic addict for alcohol. I want to emphasize that type of individual who uses food as a comfort, as a means of combating unpleasant circumstance. I had a patient who weighed 280 pounds (127 Kg.) when she came to the hospital. It was simple to reduce her weight to 160 pounds (72.6 Kg.). Her ideal weight was 140 pounds (63.5 Kg.). When she reached 160, she went to a neighboring town to take care of her mother, who had a chronic illness, of which she died. This patient, an unmarried middle-aged woman, came back having added a good deal to her weight. She said that she understood it perfectly. She detested being around sick people. She had been busy, and the only way she could stand the strain was to have tasty food everywhere she went in the house, and she deliberately ate and ate in order to avoid being cross to her mother. The other equally important thing is something we all recognize. We all know that there are different fundamental types of human beings so far as shape is concerned. We recognize the relation between the hypophysis and the shape of the individual. We know that overfunction of the hypophysis tends toward giantism. We also associate hypofunction of the gland with shortness and stockiness. With those two major types a lot of other features are associated. I see no difficulty in realizing why the short, stocky individual who becomes two or three times his normal weight bulges out in the matter of large fat pads and lumps all over, because he has less length over which to distribute this extra mass. It is interesting to observe that these lumps disappear as the result of undernutrition. Not only does the lump disappear, but the pain goes with it. I don't know how it got there, but I do know that it goes away. We needn't try to get up some special metabolic explanation for the distribution of the fat. If we relate it as much as we can to the inherent physical type of the individual, we shall explain more than we have in the past. The question of appetite is exceedingly difficult. I don't know why some people have large appetites. I do know, however, that children are often trained by their parents to acquire a large appetite gradually. It is striking to see how frequently the parents of obese children are also obese. We are all familiar with the instinctive feeling on the part of the mother that she should feed her child all she possibly can. I suppose that comes from the dim period when no human being ever got quite enough, and the mother's chief business was to see that her child got all the food available. Mothers still continue to do that. So one sees children who have been deliberately trained by their mothers to eat more and more. After a while they acquire a habit of eating more than they should. One can get some idea of the importance of habit if one keeps these people under observation in the hospital for a long time. Some of the most obese patients we have had, those who weighed over

400 pounds (181 Kg.), have gradually lost this passion for food, so that in the course of six months or a year, perhaps, they are perfectly safe. Their desire for food has again become normal. They do not overeat, even though they have every opportunity. They now have a good habit instead of a bad one.

THE MECHANISM OF GASTRIC EVACUATION *

J. EARL THOMAS, M.D.
PHILADELPHIA

My purpose in this communication is to give a brief account of the present status of knowledge of the mechanism controlling the emptying of the stomach, and to add some new information, obtained in the laboratory of the Department of Physiology, Jefferson Medical College, which may shed some light on the more controversial aspects of the subject. A theory of the mechanism regulating gastric evacuation will be outlined, which cannot be described as new but in which I shall attempt a new orientation of the points of view held by various students of the subject at the present time.

The history of the early physiology of gastric evacuation is an account of gradually increasing emphasis on the rôle of the pyloric sphincter, reaching its climax in the "acid control" theory of Cannon.[1] This theory, which appears to be a logical interpretation of the data then available, constituted the sphincter the sole arbiter of the passage of material from the stomach. The later work that has led most clinicians and many physiologists to question this theory has recently been reviewed by Murlin.[2] Without attempting to pass judgment on the relative merits of this theory and the data opposed to it, one may say that no satisfactory substitute has been suggested.

THE GASTRIC MOTOR MECHANISM

There is quite general agreement on the main features of the gastric motor function. The characteristic motility of the stomach is a form of peristalsis, beginning as feeble contractions a variable distance from the cardia and growing deeper near the pylorus. During digestion, a wave of contraction arrives at the pylorus approximately once every twenty-two seconds in the human being. In addition to the rhythmic peristalsis, Cole [3] has described alternate contractions and relaxations of the entire stomach, which he calls the systole and diastole of the stomach. If I understand Cole's terms "systole" and "diastole," they mean an increase and decrease, respectively, in the depth of the peristaltic constrictions, without alteration in their rhythm or rate of progress. There are differences of opinion as to the behavior of the last segment of the pars pylorica, which I shall not have space to consider. In any case the contractions of the gastric musculature furnish the power which drives the chyme through the pylorus into the duodenum.

THE BEHAVIOR OF THE PYLORIC SPHINCTER

It has been definitely established that the pyloric sphincter relaxes somewhat in advance of each approaching wave of peristalsis. Luckhardt, Phillips and Carlson,[4] after a combined fluoroscopic and graphic study on dogs and man, concluded that "there is a correlation between marked motor activity of the stomach (either as tone changes or peristalses) and an inhibition in tone of the pyloric sphincter." Discussing the same observations in a previous communication, Carlson [5] remarked that "in normal man and dogs the sphincter opens not with each peristaltic wave but at the end or at the height of each tonus contraction of the stomach." A careful scrutiny of their published records indicates that they were probably dealing more frequently with tone changes than with peristalsis. Nevertheless, in some of their records there is definite evidence of opening of the pylorus with each wave of peristalsis. Ivy,[6] working in the same laboratory and at about the same time, reported that "the manner of discharge of water from the dog's stomach is . . . rhythmic and could very possibly correspond to peristaltic waves."

McClure, Reynolds and Schwartz,[7] in a radiologic study of human subjects, saw chyme passing the sphincter with the approach to the pylorus of each wave of gastric peristalsis. A little later, Wheelon and Thomas [8] worked out some of the details of the pyloric mechanism in dogs, using graphic methods. They reported relaxation of the sphincter muscle in advance of each approaching wave of gastric peristalsis. Recently, with much improved methods, I have obtained still more convincing evidence that the characteristic behavior of the sphincter is as they described it.

The observations of Dr. Wheelon and myself have sometimes been cited as evidence that chyme regularly leaves the stomach with each wave of peristalsis. Since our apparatus definitely occluded the pylorus, it is evident that we did not, in the experiments referred to, observe the passage of chyme. Some confusion has doubtless resulted from the use of the terms "relaxation" and "opening" as synonymous when applied to the pyloric sphincter. Incomplete relaxation of the muscle occurs regularly with peristalsis, but the pylorus is "open" only when the pressure on one side or on the other is in excess of the resistance of the sphincter. So far as I know, the pylorus is never open in the sense that it stands open like an empty doorway, but it is frequently opened by intragastric pressure in excess of its resistance. Naturally, this is most likely to occur when the sphincter is relatively relaxed.

THE EVACUATION OF CHYME

The mechanisms described seem designed to deliver into the duodenum a certain portion of chyme once every twenty-two seconds, or with the approach to the pylorus of each wave of peristalsis. Whether they actually do so is another question, and one on which there is not unanimity of opinion. Cannon [9] found that chyme does not pass the pylorus at the approach of every peristaltic wave but emerges occasionally, at irregular intervals. On the other hand, as already stated, McClure, Reynolds and Schwartz saw chyme passing the pylorus at the approach of each antral peristaltic wave. Each of these contrary observations has been confirmed many times. A study of the older literature reveals the same divergence of experimental

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* From the Department of Physiology, Jefferson Medical College.
* Read before the Section on Pathology and Physiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

1. Cannon, W. B.: Am. J. Physiol. **20**: 283, 1907.
2. Murlin, J. R.: J. Nutrition **3**: 311 (Jan.) 1930.
3. Cole, L. G.: Arch. Roentg. Ray **16**: 242, 1911.
4. Luckhardt, A. B.; Phillips, H. T., and Carlson, A. J.: Am. J. Physiol. **50**: 57 (Oct.) 1919.
5. Carlson, A. J.: Am. J. Physiol. **45**: 87 (Dec.) 1917.
6. Ivy, A. C.: Am. J. Physiol. **45**: 420 (July) 1918.
7. McClure, C. W.; Reynolds, L., and Schwartz, C. O.: On Behavior of Pyloric Sphincter in Normal Man, Arch. Int. Med. **26**: 410 (Oct.) 1920.
8. Wheelon, Homer; and Thomas, J. E.: Am. J. Physiol. **59**: 72 (Feb.) 1922; J. Lab. & Clin. Med. **6**: 124 (Dec.) 1920.
9. Cannon, W. B.: Am. J. Physiol. **1**: 368, 1898.

results. There is no reason to doubt the accuracy of any of these observations. The matter is not one that is difficult to determine and quite probably each investigator has seen exactly what he has described. The error has been in supposing that one or the other observation represents the universal behavior of the stomach. It would appear to be evident that, unless prevented from doing so, the stomach is capable of delivering chyme to the duodenum with each wave of peristalsis. It is equally clear that it is frequently, perhaps generally, prevented in some way from doing so and delivers chyme only occasionally, at irregular intervals.

Rehfuss,[10] who holds in general to the view that gastric evacuation occurs at irregular intervals, has observed that "at the acme of digestion" the normal stomach shows a tendency toward an opening of the pylorus (exit of chyme) with each peristaltic wave. Probably the rather frequent observation of regular evacuation, especially in the clinic, is to be attributed to the common practice of making observations after a period of fasting and with a relatively small meal. Under these conditions the mechanisms, whatever they may be, that control gastric evacuation may not be stimulated to function.

THE EFFECT ON GASTRIC EVACUATION OF CONDITIONS ARISING IN THE STOMACH

Cannon [11] recognized the importance of conditions in the stomach, other than acidity. He described the delay in evacuation of the stomach when hard particles were present and noted that solid objects were repeatedly turned back by the sphincter.

In a combined chemical and radiologic study on dogs, McCann [12] obtained results that convinced him that gastric evacuation "depends on progressive relaxation of the pars pylorica," which he attributed to a change in irritability brought about by changes in the character of the gastric contents, chiefly digestion of protein. He also observed that free hydrochloric acid did not appear to be a specific stimulus to relaxation of the pars pylorica. Our own observations (Mogan and Thomas [13]) confirm this and also those of Carlson and Litt [14] and others, that acidity, so long as it is confined to the stomach, has little effect on the pylorus. McCann's conclusion that the sphincter is merely the most efficient segment of the pars pylorica is in accord with the conclusion which I [15] reached in 1922, that these structures (sphincter and antrum) are a functional unit.

The character of the intragastric stimuli so far found to have an effect on the emptying process indicates that they are mainly concerned with delaying evacuation until a satisfactory degree of digestion has been attained. If the rate of evacuation is in any way adapted to the functional capacity of the intestine, some other mechanism must be sought.

THE EFFECT ON GASTRIC EVACUATION OF CONDITIONS IN THE INTESTINE

The observation that gastric evacuation may be influenced by conditions in the intestine is very old, and the fact seems well established. The older evidence [16] has been reviewed a number of times and need not be repeated here. In most of the older work the greatest emphasis was put on the influence of acid in the duodenum, but milk [17] and fat [18] in the intestine as well as simple inflation of a balloon in the duodenum [19] have been shown to delay gastric evacuation.

Wheelon and Thomas [8] found that when a dog was given two barium meals in succession the second was evacuated much more slowly than the first. Similar observations were made on human subjects. Rehfuss [10] states that duodenal or even colonic stasis can be demonstrated to reduce or delay evacuation. Cole,[20] after stating his conception of the gastric motor mechanism, makes the following significant statement: "But if all these [peristalsis, sphincter action, and so on] are functioning normally and actively, unless there is a broad peristaltic wave [in the duodenum] to propel the chyme from the top of the cap and carry it through the duodenum in finger-like masses, functional gastric retention ensues."

Alvarez,[21] after an exhaustive review of the literature, reaches the following conclusion: "Although doubt remains on some points, it seems certain that the presence of any substance that in any way stimulates the upper bowel will delay the emptying of the stomach."

ROENTGEN STUDIES OF THE PYLORIC REFLEX

The effect of conditions in the duodenum has, until fairly recent times, been almost universally attributed to their effect on the pyloric sphincter. In fact, expressions meaning "delayed evacuation" and "closure of the sphincter" have been used as though they necessarily meant the same thing. A careful search of the literature has failed to reveal experimental evidence which justifies this point of view. Cannon,[1] indeed, gave a logical reason for adhering to it, but even he failed to make any measurements of the tone changes in the sphincter. His reasoning to the effect that, because gastric peristalsis showed little or no variation, any observed changes in the rate of evacuation must of necessity be attributed to changes in the sphincter, can be valid only to the extent that his method of measuring the force of gastric peristalsis is valid. I submit that the fluoroscope can scarcely be relied on to reveal changes in intragastric pressure, and that relatively feeble peristalsis meeting with little resistance might look very much like more powerful contractions meeting with a more effective resistance in the form of high intragastric pressure.

For much the same reasons, that which appears under the fluoroscope to be an open pylorus may be only the expression of high intragastric pressure and that which appears to be a closed pylorus only an expression of low intragastric pressure. It takes only a little simple arithmetic to show that an intragastric pressure which rises to 40 cm. of water will make a pyloric sphincter which is able to resist 30 cm. of water appear to be relaxed, whereas a sphincter that can resist only 20 cm. of pressure will appear tightly contracted when the intragastric pressure falls to 10.

10. Rehfuss, M. E.: The Diagnosis and Treatment of Diseases of the Stomach, Philadelphia, W. B. Saunders Company, 1927.
11. Cannon, W. B.: The Mechanical Factors of Digestion, New York, Longmans, Green & Co., 1911, p. 122. Am. J. Physiol. **1**: 368, 1898.
12. McCann, J. C.: Am. J. Physiol. **89**: 497 (Aug.) 1929.
13. Mogan, C. J., and Thomas, J. E.: Am. J. Physiol. **97**: 546 (June) 1931.
14. Carlson, A. J., and Litt, S.: Visceral Nervous System, Arch. Int. Med. **33**: 281 (March) 1924.
15. Thomas, J. E., and Wheelon, Homer: J. Lab. & Clin. Med. **7**: 375 (April) 1922.
16. Cannon: The Mechanical Factors of Digestion. Rehfuss (footnote 10). Katsch, G., in Bergmann and Staehlin: Handbuch der inneren Medizin, Berlin, 1926, vol. iii, part 1.
17. von Mering: Verhandl. d. Kong. f. inn. Med. **12**: 471, 1893.
18. Lintwarew, S. J.: Biochem. Centralbl. **1**: 96, 1902-1903. Edelmann, J.: Jahresb. f. Tier Chem. **36**: 414, 1906.
19. Tobler, L.: Ztschr. f. physiol. Chem. **45**: 185, 1905.
20. Cole, L. G.: Acta Radiol. **9**: 533, 1928.
21. Alvarez, W. C.: The Mechanics of the Digestive Tract, New York, Paul B. Hoeber, Inc., 1928.

Manipulations of the abdominal wall in an effort to see whether chyme can be forced through the pylorus are likewise of doubtful value in testing the tonicity of the sphincter. The extent to which an uneven distribution of pressure is possible in the abdomen would seem to be a matter for experimental determination. Clearly, an increase in pressure uniformly distributed over the stomach, pylorus and duodenum would not be likely to move the gastric contents against even minimal resistance of the sphincter. Mere deformation of a tonic stomach would probably increase the intragastric pressure but would have much less effect in one that was flabby. Here again there is the same possibility of mistaking gastric atony for pylorospasm.

Doubtless the roentgen apparatus is the most useful instrument ever devised for the study of gastrointestinal physiology, but it is important to recognize its limitations. Some problems still belong to the old-fashioned mechanical physiologist, and it seems to me that the problem of tone changes in the pyloric sphincter is one which is most likely to be solved by mechanical methods.

Even the more recent roentgen studies have failed to confirm the view that pyloric reflexes govern gastric evacuation. McClure, Reynolds and Schwartz [7] found that the stimulus most commonly supposed to control the pylorus, namely, hydrochloric acid, had no visible effect on the sphincter when placed in either the stomach or the duodenum of human subjects, except on one occasion when it was poured on the antral end of the sphincter. They described this one result as pylorospasm. On another occasion the same experiment resulted in cessation of gastric peristalsis. Similar inhibition of peristalsis was seen in other experiments with acid placed in the duodenum and after moving the duodenal tube. They chose to interpret the latter results as due to abnormal stimulation of the duodenal mucosa.

Cole [20] denies the existence of a pyloric sphincter in the ordinarily accepted sense and describes in its place a valve composed of mucous membrane and muscularis mucosae, the function of which is filtration of the chyme and not primarily that of control of gastric evacuation. I find it impossible to agree with many of the conclusions reached in the communication just cited, but I think the fact is important that the behavior of the pyloric mechanism as seen in hundreds of cases by an experienced observer gives the impression of a filtering valve rather than of a regulating sphincter.

Katsch [16] believes that the emphasis that has been placed on the rôle of the pyloric sphincter in regulating gastric evacuation is not justified by clinical observation. He states that these and also certain laboratory observations indicate that changes in the force of gastric peristalsis must also be taken into account.

LABORATORY STUDIES OF THE PYLORIC REFLEX

Carlson and Litt,[14] using an accurate method of recording changes in tonus of the pyloric sphincter, found that any irritation of the duodenum, mechanical or chemical, including acids and alkalis, induced a prolonged contraction of the sphincter. The stronger stimuli caused a more prolonged pylorospasm. Their experiments were performed on dogs under barbital or barbital and ether anesthesia. Dr. Mogan and I [18] have recently reported similar experiments in which we used both narcotized and conscious dogs. We had no difficulty in confirming the observations of Carlson and his pupil on narcotized animals, especially after section of the vagi. Under these conditions, irritation of the duodenum induces a true pylorospasm, which may last for ten or fifteen minutes.

We were much surprised to find that the results were entirely different in normal, unanesthetized dogs. When hydrochloric acid is placed in the duodenum of such an animal, the pylorus does indeed contract but only for about a minute, after which it relaxes to a greater extent than before. At the same time, the rhythmic contractions which accompany gastric peristalsis cease or are greatly reduced in amplitude. Instead of prolonging the pylorospasm, increasing the strength of the stimulus tends to exaggerate and prolong the inhibitory phase, which seems to be the predominant phase of the reaction in the conscious animal. After the animal is fed, the reflex is much less readily obtained and the contraction phase, in particular, is frequently absent.

The contraction of the sphincter in response to duodenal stimuli is known to depend on the local nervous mechanism.[22] The relaxation is the result of a central nervous system reflex over the vagus nerves, as evidence given later will indicate. Apparently, narcotics decrease the irritability of the vagus center sufficiently to mask the inhibitory reflex, which in normal circumstances soon overpowers the local contraction reflex. Such a mechanism is hardly adequate to explain the delay in gastric evacuation which is known to result from duodenal irritation.

The discovery that strong stimuli applied to the duodenal mucosa cause relaxation rather than prolonged contraction of the sphincter seems to us to be of the greatest significance. The relaxation, of itself, has no immediately obvious physiologic significance, unless it is in connection with regurgitation of duodenal contents to neutralize gastric acidity as described by Boldyreff [23] in 1904 and later by others. On the other hand, the fact that it occurs seems to us to demand an entirely new orientation of the physiology of pyloric reflexes.

On first observing the relaxation, we thought that it might be merely the result of abnormally strong stimuli and that a true pylorospasm might be induced by repetition of threshold stimuli. We therefore selected an acid stimulus of just threshold value for the initial contraction of the pylorus and applied it to the duodenum once a minute for twenty-five minutes. After the first few injections, either the results were negative or the tone of the sphincter was gradually diminished. Weaker acid solutions had the same effect as smaller amounts of stronger solutions. We were never able to produce a prolonged contraction of the sphincter in conscious animals by stimulating the duodenum chemically. Mechanical stimulation was not studied.

This observation led us to repeat the experiment of Hirsch,[24] who found that acid solutions left the stomach more slowly than water. His experiment is generally interpreted as indicating that when acid escapes from the stomach into the duodenum it reflexly closes the pylorus. In one experiment, 100 cc. of water was practically all evacuated within fifteen minutes after it was placed in the stomach, during which time the tone of the sphincter was slightly increased. When the same amount of tenth normal hydrochloric acid was placed in the stomach, about half of it was evacuated in fifteen minutes in one experiment and

22. Thomas, J. E., and Kuntz, Albert: Am. J. Physiol. 76: 606 (May) 1926.
23. Numerous references to early publications of Boldyreff are given by Boldyreff, W. N.: Bull. Battle Creek Sanit. & Hosp. 23: 65, 1927.
24. Hirsch: Centralbl. f. klin. Med. 14: 73, 1893.

only a few cubic centimeters in twenty-five minutes in another trial. Except for a primary contraction lasting two minutes in the first experiment, the tone of the sphincter was definitely less than normal during the entire time that the acid was in the stomach. Clearly, some mechanism other than pylorospasm operated to slow the rate of evacuation of the acid. The experiments can hardly be taken as evidence for "opening" of the pylorus due to acid in the stomach. The pylorus was not open in the sense that an open pylorus facilitates gastric evacuation. A logical interpretation of the relaxation of the sphincter is that it was due to the small amount of acid that escaped into the duodenum and was incidental to a more general inhibition affecting the stomach.

REFLEX CONTROL OF GASTRIC MOTILITY

Dr. Mogan and I [25] made a study of the effect on gastric peristalsis of placing acid and various other substances in the duodenum. We made graphic records of the gastric contractions by means of a balloon placed in the pyloric canal through a gastric fistula. Injections into the duodenum were made through a duodenal fistula. Experiments were performed on dogs that had survived the fistula operations for several months and were in good condition. In most of the experiments the tonus of the pyloric sphincter was recorded at the same time.

Briefly stated, our results demonstrated that hydrochloric acid, fat, acid phosphate solutions, hypertonic salt solutions and normal gastric contents when placed in the duodenum caused a decrease in the force of the contractions of the pars pylorica. The duration and extent of the inhibition was roughly proportional to the strength of the stimulus to the duodenum. The result was more striking if the stomach was empty, in which case complete cessation of contractions for a time was the rule. It was, however, easily demonstrated in the full stomach throughout the whole period of digestion. We have suggested the name "enterogastric reflex" for this phenomenon.

The effect of fat was observed only after a considerable latent period. This may mean that only the products of digestion of fat are effective stimuli or that the result with fat or its products depends on the liberation of a chemical substance into the blood.[26] Simple distention of the duodenum with physiologic solution of sodium chloride proved also to be effective, but in equal amount saline solution was a much less effective stimulus than the various other substances mentioned. Tap water was a little more effective than saline solution.

Smaller amounts of the various substances were required to cause a detectable inhibition of the contractions of the full stomach than were needed under similar circumstances to cause a minimal increase in the tonus of the pyloric sphincter. In fact, reflex contraction of the sphincter due to chemical irritation of the duodenum proved rather difficult to demonstrate during digestion. Fat did not show any tendency to contract the sphincter but caused marked and prolonged inhibition of the entire pars pylorica.

The results with gastric contents are of particular interest. Transferring 10 cc. of gastric content, following a meal of bread and water, from the stomach to the duodenum caused a noticeable decrease in the force of the contractions of the pars pylorica, without change in the tonus of the sphincter. Analysis of this result proved that it was partly due to the loss of material from the stomach but more largely the result of its action in the duodenum.

Section of the vagi in narcotized animals abolished the inhibitory phase of the response to acid and markedly augmented the contraction phase as manifested by the sphincter.

There is nothing particularly new about the observation that the gastric musculature may be inhibited by stimuli arising in the duodenum. However, previous investigators have concerned themselves with inhibition of the contractions of the empty stomach (hunger contractions) or, with few exceptions, have regarded the result as due to abnormal stimulation. Boldyreff [27] and later Bruenheimer and Carlson [28] demonstrated inhibition of hunger contractions following various forms of stimulation of the duodenum. Kirschner and Mangold [29] saw the reflex in the antral portion of stomachs which had been divided by a complete encircling incision. They thought that their observation had a bearing on the mechanism of gastric evacuation but advanced no sufficient evidence to that effect. Edelmann [18] studied the influence of fat in the duodenum and in other parts of the intestine and got results similar to ours, except that the effect on the sphincter was not observed.

All the work mentioned, including our own, was done on dogs. It is important to know whether a similar reflex exists in the human being. The observations of McClure, Reynolds and Schwartz [7] have already been referred to. Barsony and Egan [30] found that in the human being 15 cc. of 0.36 per cent hydrochloric acid in the duodenum depresses the tone of the stomach and stops peristalsis. They also cite animal experiments of the same character. From their human experiments, in which the roentgen method was used, they concluded that the inhibitory reaction was abnormal, partly because of the strength and quantity of acid necessary to cause a visible response, and partly because their subjects experienced unpleasant sensations when enough acid was placed in the duodenum to stop peristalsis.

The evidence seems conclusive that a reflex mechanism exists through which stimuli arising in the small intestine may operate to inhibit the propulsive movements of the stomach. Its significance as a factor in the regulation of gastric evacuation depends on whether or not adequate stimuli can arise under normal conditions. Our observation of the effect following the transfer of 10 cc. of gastric contents from the stomach to the duodenum is, to say the least, a near approach to normal. We have seen as much as 10 cc. of chyme expelled from the stomach at one time.

In evaluating the results of experiments with pure hydrochloric acid solutions in terms of normal gastric contents, it is logical to compare the power of the hydrochloric acid solutions to neutralize duodenal contents (total acidity) rather than their initial p_H (free acidity). When considered in this way the amounts of acid that have been used as stimuli to elicit the enterogastric reflex do not appear to be so excessive.

Even if it is admitted that most of the stimuli used were abnormal, either in the concentration or in the quantity of material, we may point to the fact that the use of a stimulus of abnormal intensity to demonstrate

25. Thomas, J. E., and Mogan, C. J.: Proc. Soc. Exper. Biol. & Med. **28**: 968 (June) 1931.
26. Farrell, J. I., and Ivy, A. C.: Am. J. Physiol. **76**: 227, 1926.
27. Boldyreff, W. N.: Zentralbl. f. Physiol. **18**: 489, 1904.
28. Bruenheimer, E. H., and Carlson, A. J.: Am. J. Physiol. **36**: 191, 1914.
29. Kirschner, M., and Mangold, E.: Mitt. a. d. Grenzgeb. d. Med. u. Chir. **23**: 446, 1911.
30. Barsony, T., and Egan, E.: München. med. Wchnschr. **72**: 1242 (July 24) 1925.

the operation of a normal reflex mechanism is a recognized procedure in physiology. We do not consider the effect of the vagus on the heart an abnormal phenomenon merely because we have to use an abnormal stimulus to make it obvious to our crude methods of observation. It must be borne in mind that to bring about any variation of function the experimenter has to compete with the normal stimuli already present and also that the degree of response required to make the effect evident must be in excess of the normal; otherwise no change is apparent.

Furthermore, to elicit the enterogastric reflex experimentally, stimuli have been applied, as a rule, to only a small portion of the intestine. There is evidence that at least the upper third of the intestine is irritable to such stimuli and under normal conditions is exposed to them in one form or another. Very probably, the reflex is elicited under normal conditions by a summation of individually inadequate stimuli.

As I visualize the operation of the mechanism comprising the enterogastric reflex, it is a delicate regulator of gastric motility, coordinated no doubt with other mechanisms of an opposite character, serving to adapt the output of the stomach to the functional capacity of the intestine in much the same manner that the vagus reflexes adapt the output of the heart to the needs of the vascular system. The first suggestion of such a comparison I owe to my co-worker, Dr. Mogan. It is not necessary to assume that the motility of the stomach is ever completely inhibited, or even visibly altered, under normal conditions. It is sufficient if the reflex is able to lengthen slightly the intervals at which chyme is evacuated or even to diminish somewhat the amount evacuated at each interval.

BEHAVIOR OF THE SPHINCTER AND THE PARS PYLORICA DURING DIGESTION

A study of gastric evacuation has been undertaken with the enterogastric reflex in mind but is as yet incomplete. While a final statement is not warranted at the present time, such observations as we have made are entirely consistent with the idea that changes in gastric motility rather than in the sphincter are the main factor in regulating evacuation. We have watched the stomach of the dog empty while recording peristalsis in the pyloric canal and the tone changes in the sphincter. The progress of evacuation was followed by occasionally opening a tube which drained the first part of the duodenum.

Under our experimental conditions we find the sphincter with a low tonus in the empty stomach. When the animal eats, after a brief preliminary relaxation the sphincter increases its tonus to a marked degree and thereafter during digestion never relaxes to the tone level characteristic of the empty stomach. The changes in tonus are the same as described by Cannon [1] up to the time that evacuation begins. From that point on, instead of the alternate decreases and increases in tonus mentioned in the older literature we have seen only a steadily maintained high tone level. The tonus neither increases nor decreases at the moment the stomach begins to evacuate. There are only the rhythmic contractions and relaxations, synchronous with peristalsis, on a relatively constant tone level. There are, in the conscious animal, occasional moderate alterations in tone of the sphincter whether the stomach is full or empty, but we have not as yet been able to determine that any relationship exists between these changes in tonus and the evacuation of chyme. The tone of the sphincter is, if anything, a little higher when the stomach is most actively emptying than when the evacuation is less active.

The records show vigorous and, at first, regular contractions in the pars pylorica as soon as the stomach is partly filled, beginning a few minutes after the animal begins to eat. Later the contractions become less vigorous and markedly irregular in amplitude until, near the end of digestion, they become so weak as to be difficult to record.

Liquids taken with the food were, as Cannon [31] and others have observed, apt to pass the sphincter in quantity before its initial increase in tone. Later they were evacuated more slowly and at irregular intervals. There was nothing in our observations to suggest that during digestion the tone of the sphincter is regulated reflexly from the duodenum and much to indicate that gastric peristalsis is so regulated.

THE FUNCTION OF THE PYLORIC SPHINCTER

A certain amount of resistance to the evacuation of chyme is necessary at the pylorus in order to permit the gastric muscle to perform its function of maceration and also to withhold solid or undigested food from the duodenum. Available facts indicate that the principal function of the pyloric sphincter is to furnish this resistance. If the sphincter is to perform this function efficiently and at the same time permit the stomach to empty, it is evident that its tonus must, on the whole, bear a relatively constant relation to the general intragastric pressure. The exact relation between the resistance at the pylorus and the average intragastric pressure has not been determined experimentally, but recent observations indicate that increased or diminished tonus in the stomach is accompanied by similar, rather than by opposite, changes in the tonus of the sphincter. Thomas and Wheelon [15] found this to be true for the effects of stimulation of the extrinsic nerves, and in experiments already reported it was seen also to be true for the results of certain reflexes. The primary contraction of the sphincter, when strong stimuli are applied to the duodenal mucosa, is an exception.

The erroneous idea that a reciprocal relation exists between the tonus of the sphincter and that of the stomach was inherent in the older theories, which also regarded the sphincter as the regulator of gastric evacuation; but there is no necessary connection between the two ideas. Although there is evidence that the response of the sphincter and of the rest of the stomach to most stimuli is qualitatively similar, quantitative differences in response must be assumed in any theory that recognizes regulation of evacuation as a fact. Reasons have already been given for believing that the sphincter is not the most important factor in regulating the emptying of the stomach.

Wheelon and Thomas [8] found that the sphincter exhibits an active contraction when peristaltic activity occurs in the first part of the duodenum. Thus the sphincter also serves to limit duodenal regurgitation. I have never been able to determine to my own satisfaction whether the contractions that are recorded by various devices in the pylorus and accompany activity in the duodenum are, in reality, contractions of the gastric sphincter or are due to contraction of the first rings of duodenal muscle. The function would be the same in either case.

Relaxation of the sphincter due to acid in the stomach has occasionally been invoked as an explana-

31. Cannon: The Mechanical Factors of Digestion, p. 115, footnote.

tion for duodenal regurgitation to neutralize excess gastric acidity. A more satisfactory explanation may be found in the relaxation of the sphincter that occurs as a part of the enterogastric reflex aroused by acid in the duodenum.

SUMMARY AND CONCLUSIONS

At the beginning of this article I proposed to outline a theory of gastric evacuation. I am prompted to do this by the conviction that further progress in the study of this subject may be facilitated if some one makes a start in the direction of coordinating the information that has come to light since the "acid control" theory was proposed by Cannon. The following theory will be based on the information presented, which is obviously not complete but is, I think, sufficiently inclusive to represent most of the several trends that have developed in the recent study of the subject.

A dogmatic style is adopted for the simplicity and brevity which it affords, but I do not wish to give the impression that the status of our knowledge warrants an unequivocal statement. There will be no misunderstanding if the term "theory" is understood in its correct sense.

Gastric evacuation occurs whenever the intragastric pressure near the pylorus exceeds the resistance due to the sphincter. The gastric motor mechanism is adapted to establish this condition at regular intervals, corresponding to the rhythm of gastric peristalsis, or the gastric cycle. Such a mechanism, if allowed to operate without regulation, would empty the stomach, regardless of the state of digestion of the food, and without allowing for the ability of the intestine to handle it. Since this does not occur, the mechanism is obviously subject to regulation.

Regulation results from stimuli due to conditions within the stomach and within the small intestine. Stimuli from within the stomach are responsible for withholding the gastric contents until a satisfactory state of digestion has been attained. Stimuli from within the intestine are responsible for adapting the rate of evacuation to the functional capacity of the intestine.

Regulating stimuli from within the stomach are aroused by the consistency and state of chemical digestion of the food. Chemically undigested food (especially protein) and solid particles delay evacuation. Acid, so long as it is confined to the stomach, is not a regulating factor. Intragastric stimuli delay evacuation by increasing the tone of the sphincter and of the antrum, of which the sphincter is "the most efficient segment." They determine the initial evacuation and thereafter play a steadily diminishing rôle to the end of digestion.

Regulation from within the intestine results from chemical and mechanical stimuli. Chemical stimuli comprise acidity (not necessarily free hydrochloric acid), products of digestion (especially of fat), and perhaps physicochemical (osmotic) conditions. These stimuli operate through two reflex paths, one in the myenteric plexus, which mediates a motor reflex, causing increase in tone of the sphincter, and another through the vagi, which mediates an inhibitory reflex (the enterogastric reflex), causing decreased motor function of the entire pars pylorica, including the sphincter. The enterogastric reflex has the lower threshold and ordinarily dominates the local reflex. It is therefore the chief if not the only factor in the chemical regulation from the intestine. Mechanical stimuli (due to distention) are kept at a minimum [32] through a receptive relaxation of the duodenum. Chemical stimuli are diminished in effectiveness by intestinal, pancreatic and biliary secretions, which tend to neutralize acidity, and by intestinal motility, which moves the stimulating material to less irritable segments of the intestine. Thus, gastric evacuation is adapted quantitatively to the secretory and motor capacity of the intestine and its associated organs. The intestinal regulatory mechanism begins to function only after evacuation of the stomach has begun and thereafter plays a steadily increasing rôle to the end of digestion.

The regulatory factors (gastric and intestinal) tend to delay evacuation and are balanced against the inherent rhythmicity of the stomach and possibly also unknown excitatory reflex or chemical stimuli.

The tonus of the pyloric sphincter is chiefly determined by stimuli affecting the stomach muscle as a whole. Hence its tonus changes are in the same direction as, and not opposed to, the tone changes of the remainder of the pars pylorica. It serves as a constant resistance to the passage of chyme and blocks the exit of solid particles. By maintaining a narrow orifice it "filters" the gastric contents. By contracting when the duodenum contracts, it also limits regurgitation.

1017 Walnut Street.

32. Joseph, D. R., and Meltzer, S. J.: Am. J. Physiol. 27: xxxi, 1911.

ABSTRACT OF DISCUSSION

DR. A. C. IVY, Chicago: I believe that Dr. Thomas has the most normal device and method and preparation for studying the physiology of the pyloric sphincter that have been and are now being employed. In the first piece of research work which I did in the physiologic laboratory, I found that the time of ejection in the duodenum was correlated with the pylorospastic action of the stomach. I should like to ask Dr. Thomas whether he has studied the effect of his device on the emptying time of the stomach. Has he determined the emptying time of the stomach before the insertion of his device and then with his device in place?

DR. J. EARL THOMAS, Philadelphia: The effect of the presence of the apparatus on the emptying time has not been determined accurately. I am under the impression that it is slightly but not greatly prolonged, this being based merely on casual observation in the animals as I studied them on the table. The apparatus does not prevent emptying, because I have habitually left it in over night, the animals being fed after the apparatus was put in place, and their stomachs were found completely empty on examination the next day. I have on several occasions noted that, following a fairly large meal (approximately 300 Gm. of dog biscuit or dog chow with a pint of milk), after two or three hours the stomach was practically empty. This seems to me to be approximately normal.

Action of Spleen on Abnormal Cells.—Recent knowledge makes it almost certain that in pernicious anemia some gastric ferment is absent. The ferment is concerned with the digestion of protein but is probably not pepsin, although its absence appears to be always associated with achlorhydria. The product of the action of this ferment upon protein, which is stored within the liver, appears to be necessary for the full development of the megaloblasts and, if it is absent, these cells are unable to develop and therefore proliferate. Being immature cells they are destroyed by the spleen. In cases of pernicious anemia the administration either of the ferment in the form of raw hog's stomach or of the prepared product in the form of liver, in which it is stored, allows the megaloblast to develop and causes a rapid improvement in the symptoms. So beneficial are the results of this form of treatment that splenectomy today is hardly ever considered. It would, however, appear probable that occasionally cases might be seen in which the destructive effect of the spleen had become so established that the administration of this substance would be insufficient unless accompanied by splenectomy.—Walton, A. J.: The Surgery of the Diffuse Splenomegalies, *Lancet* 2:1004 (Nov. 7) 1931.

SUPRAPUBIC PROSTATECTOMY *

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AND
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NEW YORK

The presentation of a paper on the surgical treatment of hypertrophy of the prostate usually means that the authors hold a brief for either the suprapubic or the perineal method of approach. The subject may be presented as a dogmatic assertion of the superiority of a certain technic under all circumstances or as an argument setting forth the relative merits of the opposing methods and awarding the verdict in favor of that which the particular author believes to be superior. The discussion which follows a paper of either type shows plainly that the choice of the avenue of approach is still a highly controversial subject.

We are not advocates of either party. We have found that both methods have wide usefulness and that neither is applicable to all cases. It is our feeling that the really able urologic surgeon is he who can choose the method best suited to deal with the special pathologic

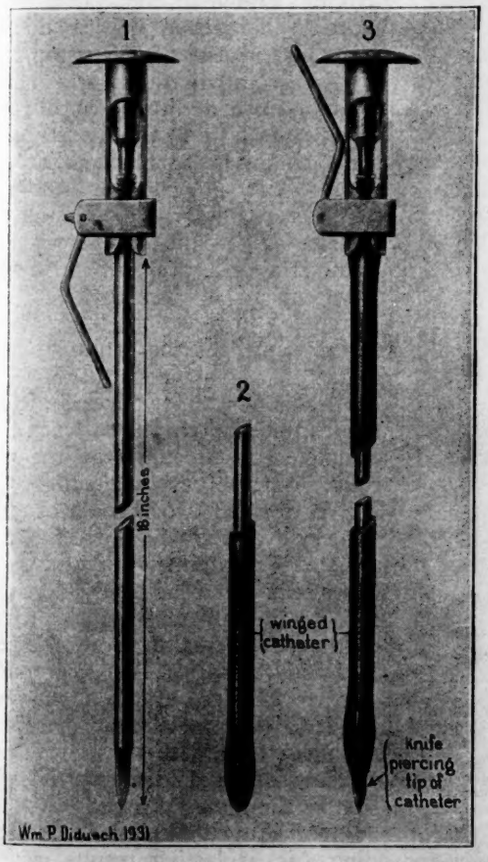

Fig. 1.—Mr. Kidd's instrument used for suprapubic cystostomy: 1, instrument with knife at end; the lever at the upper end is used to hold the catheter firmly to the instrument. 2, the catheter (a winged catheter) has been placed on the instrument and the knife is about to pierce the tip of the catheter. 3, the catheter is now on the instrument and the knife has pierced the tip. The lever above holds the catheter on the instrument.

condition presented to him and is technically equipped to perform either operation with equal facility.

The old controversy as to the relative importance of heredity and environment in the formation of human character finds a counterpart in that over the influence of suprapubic or perineal approach in producing a thoroughly satisfactory prostatectomy. The chief reason for the popularity of the suprapubic operation is that the surgeon can carry it out with little aid, whereas the proper performance of the perineal procedure requires a team with a considerable amount of training. Suprapubic prostatectomy may be, and often is, a one-man procedure. Perineal prostatectomy never can be.

Therefore, to make an intelligent choice of route, the operator must consider a number of factors outside the

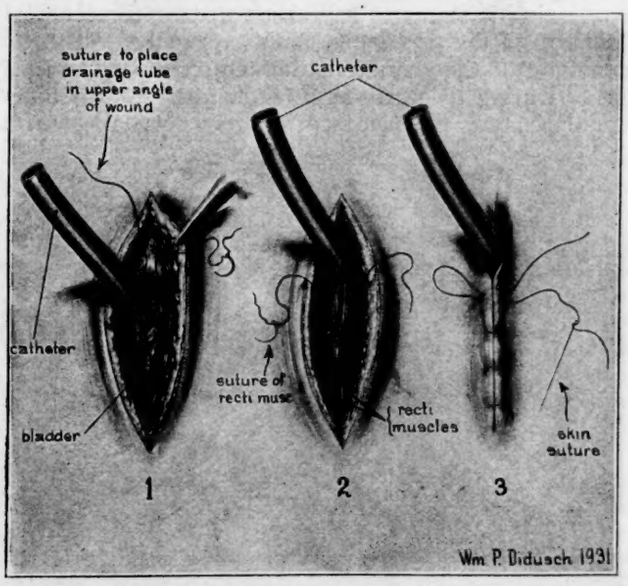

Fig. 2.—Suprapubic cystostomy (use of Mr. Kidd's instrument): 1, the drainage tube or catheter sutured to the bladder wall now being sutured to the upper angle of the wound. 2, suture of the rectus muscles with interrupted stitches. 3, final skin closure with tube coming out of upper angle of wound.

purely technical, for it is on these, as much as if not more than on his surgical judgment and technical skill, that low mortality rates and good final functional results depend. In urologic work, to insure proper handling of the patient before and after operation, the entire staff—interns, nurses and orderlies—must be pressed into service, and all who share the work must have at their disposal the equipment of an institution devoted solely to urology, with all up-to-date instruments and facilities. Surgeon and patient must have the advantages of proper cooperation and coordination before, during and after the operation. In short, prostatectomy should be carried out under the most ideal conditions.

Institutions devoted solely to urology are rare. Usually the visiting surgeon must do his work in a hospital taking all kinds of cases, where the members of the staff are trained for general surgery but lack any specialized familiarity with urologic technic. So it comes about that the visiting urologist is frequently compelled to operate on a patient improperly or deficiently prepared, under operating room conditions which offer him but poor facilities and equipment. Even if every technical assistance is offered him at the operation, he is thereafter compelled to leave his patient in charge of interns, nurses or orderlies, who, for the most part, are unfamiliar with the special care needed in these cases and are absolutely uninterested in the final outcome of this particular case.

This shows that statistics as to relative mortality rates give no criterion by which one can judge the efficacy of either method of prostatectomy. One must always take into consideration the conditions under

* Read before the Section on Urology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

which the procedures are carried out, quite as much as one must reckon with the individual patient's systemic state and powers of resistance. The prime necessity is to be open minded. This applies with equal force to the operator and to the audience that listens to his report of the result of his efforts.

HISTORICAL REVIEW

More than a century has elapsed since hypertrophy of the prostate was recognized as a frequent cause of urinary obstruction. The first practical clinical work concerning it seems to have been that of Sir Everard Home, and the first monograph having the pathologic condition of the prostate as its subject came from his pen. During the early and middle years of the nineteenth century the names of surgeons well known in other fields are to be found connected with attempts to relieve the distressing conditions brought about by hypertrophy of the prostate. Guthrie, in England, and Civiale and Mercier, in France, elaborated technic and devised instruments for this purpose. In 1878 the Italian Bottini substituted the cautery for the knife as a means of excision of hypertrophied tissue, and four years later Leisrink was first to make use of a suprapubic cystotomy incision as an avenue of approach instead of the perineal route followed by the medieval lithotomists.

So rapid was the advance in surgery of the prostate at this time that in 1890 Watson was able to find material to fill a volume of considerable size devoted exclusively to this subject. In this book both suprapubic and perineal procedures are discussed, and it can be perceived that already the surgical fraternity was dividing into factions having pronounced opinions as to the relative merits of the two avenues of approach. Some time before Watson's book made its appearance, McGill of Leeds, England, delivered before the Clinical Society of London a description of an operation he had devised, using Sir Henry Thompson's suprapubic lithotomy opening by which to reach the prostate and give visibility to the site of the tissues he then proceeded to eliminate. In presenting this operation, McGill was the first to promulgate the idea that permanent relief of urinary obstruction was not only theoretically possible but clinically probable.

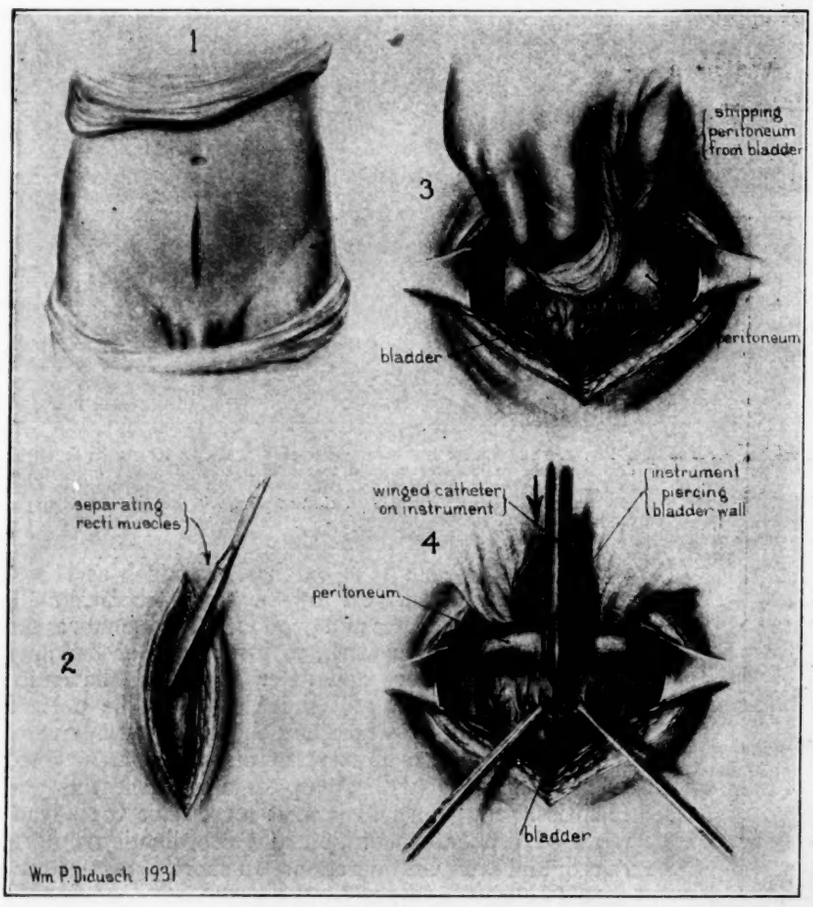

Fig. 3.—Suprapubic cystostomy (use of Mr. Kidd's instrument): 1, skin incision. 2, rectus muscles are separated by handle of scalpel. 3, stripping peritoneum from bladder wall; bladder below and peritoneum above. 4, peritoneum has been drawn upward, bladder exposed, Allis clamps applied and the sharp knife end of the instrument is plunged into the bladder. A winged catheter has been placed on the instrument, and the knife has pierced the tip. The catheter is carried into the bladder with the instrument and then the instrument is removed, leaving the catheter in place.

McGill's work turned attention to the advantages of the suprapubic approach and did much to free British surgeons from the inherited trammels of the old ways of "cutting for stone." In the United States the perineal route had long before found an ardent advocate in Gouley of New York, in whose textbook this avenue of access to an enlarged prostate is mapped out in detail. A better known American surgeon, Belfield of Chicago, advocated a combination of the suprapubic and the perineal methods, yet there is little in the literature of the period that indicates a general acceptance of his views. The perineal method found a champion in England in the person of Reginald Harrison, who included a description of perineal prostatectomy in his textbook. Yet it is customary to look, not to England but to Germany, for the origin of the procedure as it is now used. It was Zuckerkandl who, two years after Harrison's publication, put forward the first complete prostatectomy by the perineal route of the type practiced today. Thereafter the two schools of prostatic surgery diverged widely from each other as the development of the separate operations moved steadily forward.

With the opening of the twentieth century, Albarran in France, Freyer in England, Young in America, and many another besides, attacked the problem presented by prostatic hypertrophy, and advanced toward the procedure of complete, as opposed to the partial, elimination of the diseased tissue. As far back as 1895 Eugene Fuller emphasized the necessity for doing this, if lasting results were to be obtained from attempts to do away with prostatic urinary obstruction.

Freyer made a remarkable contribution, not only to operative work on the prostate but to operative surgery in general. The most valuable feature of his procedure is avoidance of trauma to the upper part of the vesical orifice, the operator working away from—not toward—the important plexus of Santorini. Through a suprapubic incision he located the most prominent portion of one lateral lobe. The mucous membrane of this portion was scored through with the sharpened fingernail and the enlarged glandular tissue gradually

freed and enucleated by finger dissection. Thomson-Walker modified Freyer's "closed method" so as to make it an "open" one, and further modifications to this technic were supplied by Judd of the Mayo Clinic. The procedure about to be described follows the general principles laid down by Freyer.

WHEN SHALL ONE DO A SUPRAPUBIC PROSTATECTOMY?

It is probable that surgeons operating on the prostate, like other mortals, often follow the line of least resistance, making routine use of the method that happens to be the easiest for them to carry out successfully. If accident, or the enthusiasm of some particular teacher or of a group of associates, interests a man in a special form of procedure so that he attains a reasonable amount of skill in doing it, he is likely never to bestir himself to acquire facility in any other. When once his position is defined, he defends it manfully, becoming ever more confirmed in his belief that the particular route he has selected is the only one to be considered, no matter what the character of the case presented to him.

Such an attitude should be combated by every one who has the real interests of his patients at heart, or is in any way concerned with the maintenance of a high standard in urologic surgery. The only criterion by which selection of the operative route can be made is the individual requirements of the particular case in hand. As Randall has explained, the prostate can enlarge in but one of two ways. It is so hedged about by fixed anatomic structures that it must always grow upward. Most frequently as it enlarges it dilates the internal sphincter and finally herniates through it, so that eventually the hypertrophied gland is forced into the bladder cavity. The second mode of enlargement is likewise upward, but in this type the sphincter remains tonically closed. As the size of the gland increases, it raises up not only the sphincter but the entire bladder mass. The sphincter is never dilated, so that the hypertrophied gland always remains within its natural anatomic limits.

In any operation the perfect result depends on preservation of the sphincter's structure and function. So, if the sphincter has been gradually dilated, the surgical indication is to remove the growth by suprapubic prostatectomy, for this will in no way injure the dilated sphincter. If enlargement of the gland has caused no dilatation, the growth can be reached suprapubically only by manual dilation of the sphincter. This will lead to traumatism and the long chain of unpleasant, or even fatal, results which a crippled sphincter invariably brings about. Therefore, to the prostate still within an intact sphincter, the better approach will be by the perineal route. Diagnosis thus becomes of the very first importance. The choice of operation should rest on the cystoscopic and other evidences obtained by careful examination and consideration of every other factor involved. Nor are the anatomic and pathologic features the only ones to be considered in arriving at this decision. Except in a very few fortunate instances, the loss of time and hospital expense must be reckoned closely, and the route by which the prostate is approached will in a certain measure influence these purely economic aspects of any given case. Estimating the disability is not of such paramount importance in patients of prostatic age as in younger patients, but it is, notwithstanding, vital enough to make it necessary to reckon with under nearly all circumstances.

CHOICE OF THE ONE, TWO OR THREE STAGE OPERATION

The economic aspect also serves to shift the emphasis from the choice of route to the decision as to whether it shall be a one or a multiple stage procedure. Here again one must endeavor to free oneself from prejudice and consider each case on its individual merits. The enormous benefit some patients have received from prolonged preliminary suprapubic drainage has not unnaturally persuaded many operators that this should be instituted as a routine. Yet in a series such as that reported by Young, in 1923, suprapubic drainage was carried out in less than 1 per cent. And the author emphasizes its dangers in cases in which there is a large quantity of residual urine, with a very low phenolsulphonphthalein output. If the perineal enucleation has been decided on, the added difficulty induced by the scar tissue resulting from the old suprapubic cystotomy must be reckoned with. Yet in patients intolerant of

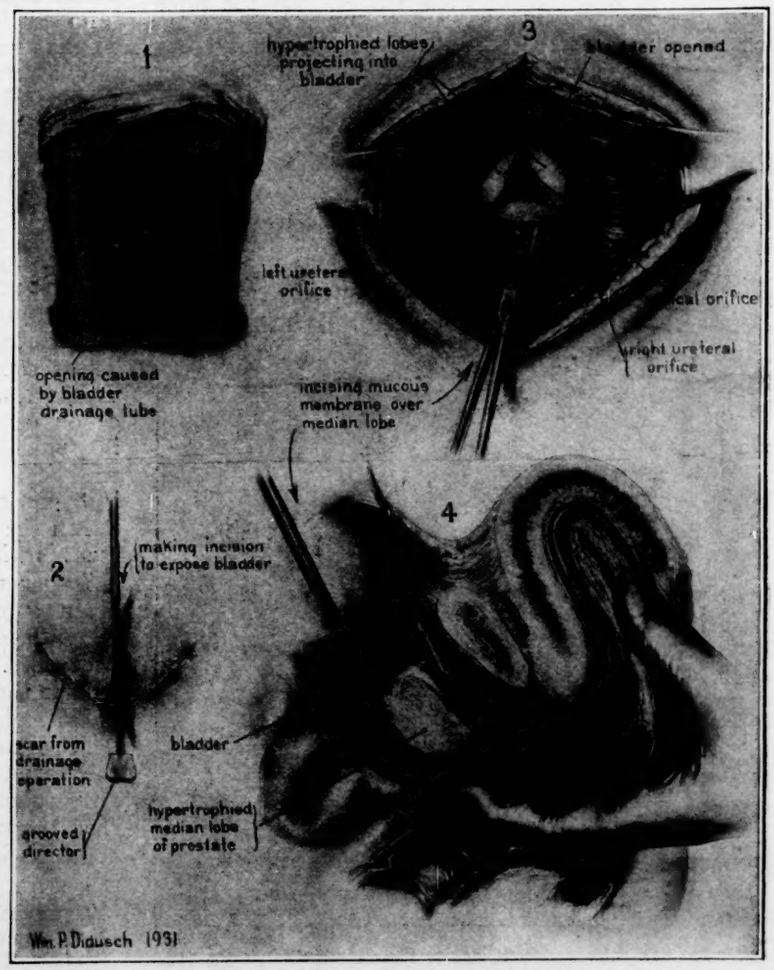

Fig. 4.—Suprapubic prostatectomy: 1, incision (dotted line) for the second operation, through virgin tissue. 2, incision made on a grooved director. 3, bladder has been opened, exposing the intruding prostate; with the scissors a nick is made in the most prominent presenting portion. 4, a finger in the rectum pushes the prostate well up into the bladder.

prolonged catheter drainage these disadvantages will have to be overcome in the best way possible. We have found that statistics on this subject are apt to be misleading.

When suprapubic cystotomy is a routine the suspicion arises that some of the cases might have done equally well or better with an indwelling catheter. This has, indeed been our actual experience. Rarely, a patient whose bladder neck is in good condition, who shows no edema and exhibits no abnormalities in pulse and temperature, with good reports on urinary function and output, will require no cystotomy. There can be no hard and fast rules laid down. We must trim our sails to meet the wind.

The same is true of the choice of carrying out the procedure in one, two or three stages. Of the three

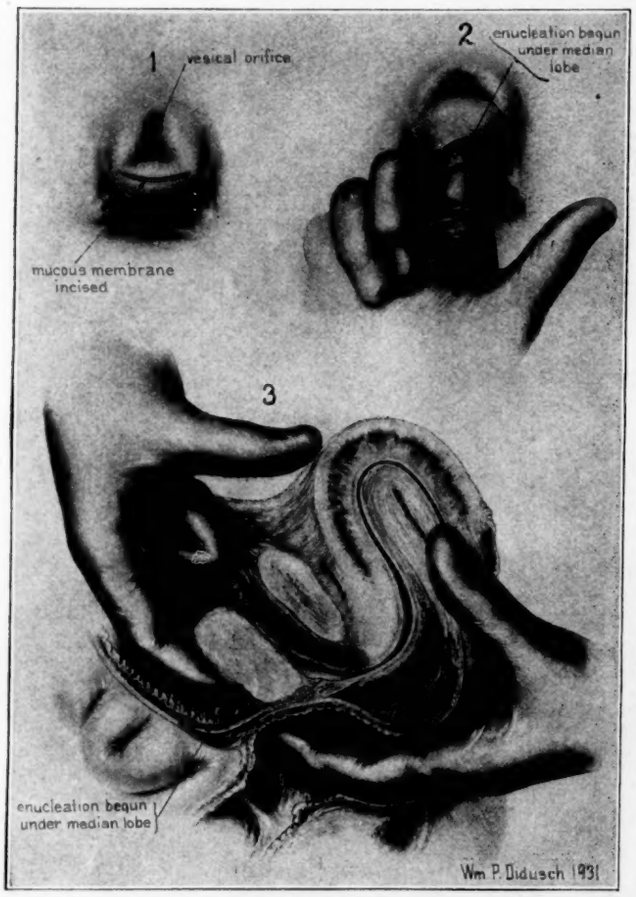

Fig. 5.—Suprapubic prostatectomy: 1, the capsule slit. 2, the finger is then introduced and enucleation commenced. 3, sagittal view of enucleation.

stage procedure, beginning with the prevesical section described by Handley Williams and recently recommended by Keyes and Neff, it may be said that, since we have used the transverse incision suggested by Macgowan nearly twenty years ago, a three stage procedure is never necessary. This incision, as modified by one of us (O. S. L.) is an inverted V, deepened through the fascia of the recti on either side, giving an excellent exposure of the fundus, but when so wide a view is not necessary, simple puncture, as carried out with the instrument designed by Mr. Frank Kidd of London will be found adequate.

Preliminary drainage is usually effected by means of the incision just mentioned, a more detailed description of which will be found in the article published by one of us [1] recently. An inverted V incision—its apex well above the highest point attained by the dome of the distended bladder—is used, the sheath of the recti being incised on either side and the muscles themselves cut, either partially or entirely as the case may demand. Dissection along the urachus leads directly to the highest point of the bladder fundus. The exposed bladder is then grasped by Allis clamps, incised between the clamps, and its content removed by suction. A double suction tube is sutured to the apex of the wound, plain catgut sutures being passed through the fascia. A small cigaret drain is inserted along the vesical suture line.

Not every case, however, is suited for this particular type of drainage. If such a wide exposure is not found to be necessary, the method of Kidd, to which reference has already been made, will give good results. The instrument that Mr. Kidd has designed is, by the way, a return to the very ancient methods of relief of urinary obstruction resorted to by the surgeons who first undertook to treat prostatic hypertrophy. No more exact measure of the enormous advances which little more than a century has seen in urologic surgery could be supplied. With modern knowledge and equipment, puncture of the bladder, once a most hazardous procedure, is employed by the foremost members of the urologic profession with safety and facility.

Kidd employs a vertical incision which is deepened by separating the recti with the handle of the scalpel. The peritoneum is stripped from the bladder wall and drawn upward, exposing the bladder. After the application of Allis clamps, the cutting end of the Kidd instrument is plunged into the bladder wall, carrying with it a winged catheter, previously placed on the instrument, the tip of which is pierced by the knife. When the cavity of the bladder is entered the instrument is withdrawn, leaving the catheter in place.

In general, it may be said that the preoperative care given suprapubic prostatectomy patients is identical with that expended on those treated by the perineal procedure. It is not uncommon to hear a surgeon explain that ureteral catheter drainage leaves the suprapubic region a virgin field for operative intervention, which is much more convenient for the operator. While this is unquestionably true, it would seem proper to suggest that it is the best welfare of the patient, rather than the convenience of the surgeon, which should be considered.

OPERATIVE TECHNIC

The suitably prepared and anesthetized patient is arranged on the table in the proper place to assume the Trendelenburg position. The high suprapubic fistula is then incised downward toward the symphysis and the bladder wound incised toward the vesical orifice. The capsule of the most projecting portion of the prostate is opened with scissors. This is usually one of the lateral lobes. The operator's finger is inserted through the opening, the line of cleavage established, and the enucleation accomplished by sweeping the index finger in all directions inside the capsule until all the enlarged gland has been freed from it. Great care is exercised to avoid splitting the top of the vesical orifice, with the inevitable injury to Santorini's plexus this accident involves. This follows the technic originated by Freyer and practiced generally by present-day British surgeons.

When the prostate is enucleated by the perineal route according to our technic, the verumontanum is respected and the orifices of the ejaculatory ducts do not suffer injury. Therefore, preliminary vasotomy is unnecessary. When we employ the suprapubic procedure, on the other hand, we have found

1. Lowsley, O. S.: Am. J. Surg. 11: 305 (Feb.) 1931.

that injury to these orifices is not easily avoided. When the finger reaches the verumontanum, some difficulty in enucleation is invariably encountered. As this is the most distant point that the finger endeavors to reach, a short finger may not be able to attain it. Consequently, the gland may have to be grasped and torn away, usually bringing with it some or all of the verumontanum's mucosa. The ejaculatory duct orifices are thus denuded of their natural protection against infection, and epididymitis is likely to occur. For these reasons we believe that bilateral vasectomy should be done in conjunction with every suprapubic prostatectomy.

The prostate enucleated, the patient is put into the Trendelenburg position, so that all remaining tags of tissue can be carefully cleared away, leaving the prostatic capsule smooth, with no débris to undergo necrosis and encourage infection of the cavity left by removal of the gland. If any bleeding points persist, they can be clamped while the patient is in this position.

It is our practice to pack the cavity with petrolatum gauze. As this is a semifluid substance the prostatic capsule will expel a portion of it, should the packing be too tight, thus automatically relieving any undue pressure. An added advantage of petrolatum gauze is that its removal causes less discomfort to the patient. After reinsertion of the double-suction Kenyon tube, the wound is closed in layers.

The packing is removed from thirty-six to forty-eight hours after operation. This procedure is now rendered far less distressing to the patient if one follows the suggestion of Dr. Bugbee to instil 2 or 3 ounces of 2 per cent procaine borate into the bladder preceding the dressing. A ureteral catheter is inserted about the sixth postoperative day and the patient lifted from bed on the seventh day, fitted with a tight binder and permitted to sit in a chair for three quarters of an hour. The time of sitting up is increased daily as the upright position favors drainage and the psychologic effect is favorable to more rapid convalescence. Three weeks after prostatectomy the sphincter is dilated—preferably by the Kohlman dilator. This precaution is necessary to overcome the tendency to stricture of the vesical orifice due to contraction of the round wound during healing and scar formation. We frequently see patients in our service for whom this has been neglected by other surgeons, and it is sometimes necessary to resort to a cutting operation to relieve the stricture, such as external urethrotomy, suprapubic exposure with incision and dilation of the internal sphincter or employment of the Maisonneuve instrument.

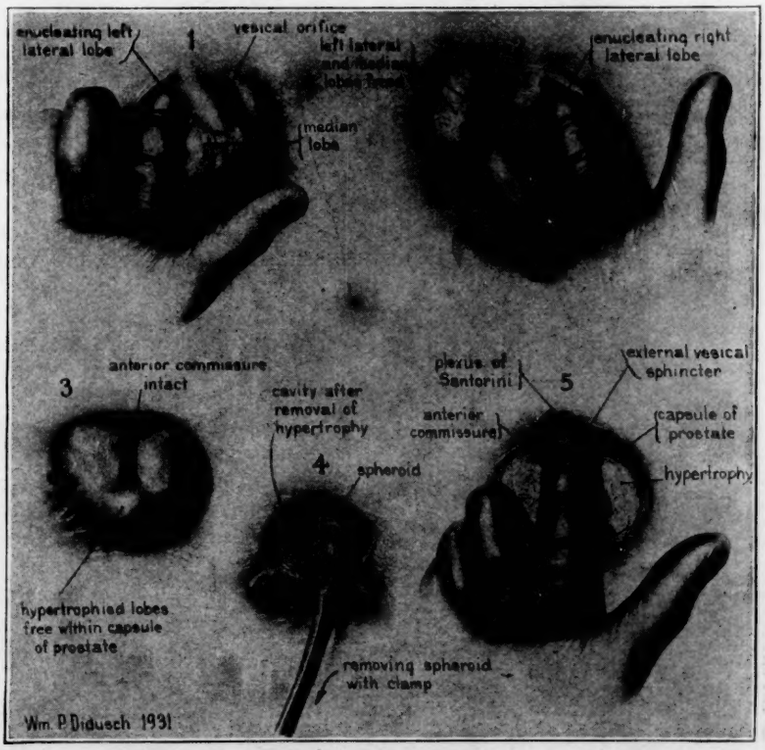

Fig. 6.—Suprapubic prostatectomy: 1, the enucleation of the prostate is continued. 2, during the continuation of the enucleation, care is taken not to injure the top of the vesical sphincter.

ANALYSIS OF FIFTY CASES

A summary of fifty cases of suprapubic prostatectomy taken from our records permits of no conclusions as to the advantage of this procedure over others—nor is it offered with any such thought in mind. The series is offered merely as illustrative of the various points already brought up.

Forty-four patients presented benign hypertrophy of the prostate, five had carcinoma, and one, granuloma. The oldest patient was 85 years of age, the youngest (the granuloma case) 32. The shortest period of hospitalization was 26 days; the longest 132 days; the average was 40.23 days, or, roughly, about six weeks. But one patient died from the immediate effects of operation; this was the oldest of the series, who succumbed to postoperative shock. Three other deaths bring the mortality up to 8 per cent. One was due to cardiac failure, fourteen days after removal of a carcinomatous prostate; in a second fatal case there was coronary thrombosis, with a previously existing chronic myocarditis. The autopsy on the body of a third patient, who died on the second postoperative day, disclosed multiple abscesses of the left kidney and a left nephrolithiasis.

From the patient's point of view at least, the ability to control urination is the measure of the success of any prostatectomy. In this series control is noted as "perfect" in six cases, as "fair" in four, while two are noted as having "no control." In the remaining thirty-four cases, control was satisfactory. In two of the patients who had only partial control, a previous Young punch procedure had been carried out without relief of symptoms. In two cases hemoglobin was so low that transfusion had to be done, but the ultimate results justified the precautions taken. Wound healing was delayed in some of the oldest patients, one patient, aged 71, having a proteus infection and never recovering full urinary control. A hospital stay of more than eleven weeks was necessary in the case of a man, aged 71, who developed a pleural effusion. We are dwelling especially on the complications, for the series as a whole presents an average of results which would seem to indicate that a careful selection of cases suited for suprapubic prostatectomy is fully justified by the final outcome of the procedure. In closing, we would once more emphasize the importance of viewing each separate patient as presenting an individual problem worthy of the closest study. From the results of such study one must make a decision as to the method of approach to the diseased prostate. The greatest success will always be for the surgeon who never fails to keep an open mind.

CONCLUSIONS

1. The surgeon operating on the prostate must adapt the procedure employed to the special needs of the patient involved; there can be no routine technic applicable to all cases.

2. Suprapubic prostatectomy is a one-man operation; perineal prostatectomy requires cooperation of a trained team.

3. If the prostatic hypertrophy has dilated the internal sphincter, enucleation of the gland is better done by the suprapubic route. When the enlarged gland has remained within its natural anatomic limits, it can be reached more safely and conveniently by way of the perineum.

4. We prefer the technic of suprapubic prostatectomy devised by Freyer more than thirty years ago, whose procedure consisted of enucleation of the gland through an incision in its capsule, using the finger to detach it from the capsule, and observing great care not to injure the plexus of Santorini situated at the top of the vesical sphincter, as such injury is likely to induce severe hemorrhage.

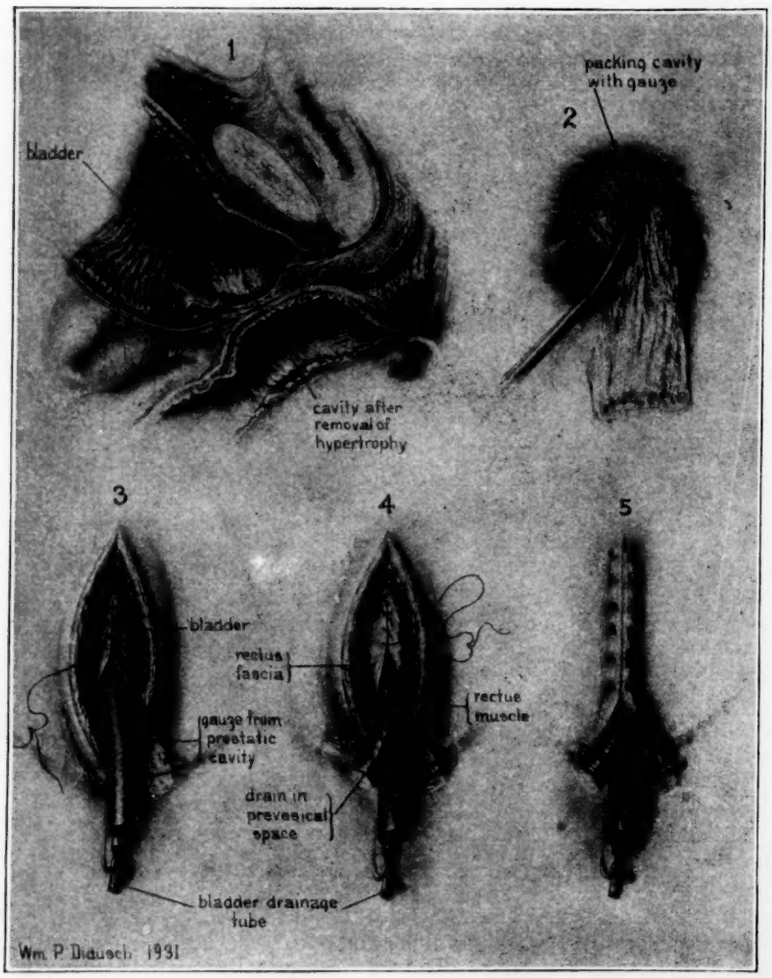

Fig. 7.—Suprapubic prostatectomy: 1, sagittal view showing the appearance of the cavity after removal of the prostate. 2, the cavity is packed with petrolatum gauze. 3, the Kenyon double suction tube is fixed in position at the top of the vesical wound. 4, at the top of the wound in the body wall, a cigaret drain is being inserted. 5, skin incision closed, with tube and drains emerging at the top.

5. As suprapubic enucleation is prone to tear the mucosa from the verumontanum, thus exposing the orifices of the ejaculatory ducts to infection, a bilateral vasectomy should always accompany suprapubic prostatectomy.

6. Preliminary drainage is a prerequisite to successful prostatectomy but may be accomplished in a number of ways, according to the needs of the individual patient. Cystotomy employing MacGowan's transverse incision, vesical puncture with Kidd's instrument, and the indwelling catheter have all given us satisfaction on different occasions.

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PROSTATE OPERATION

PROSPECTS OF THE PATIENT WITH PROSTATIC DISEASE IN PROSTATECTOMY VS. RESECTION *

THEODORE M. DAVIS, M.D.
GREENVILLE, S. C.

In considering the prospects of patients with any pathologic condition, it is necessary to consider the etiology. Neither the origin nor the nature of enlargement of the prostate gland is established. The controversy continues whether it is a true adenoma or a hyperplasia. Evidence seems to justify the opinion that the enlargement is a hyperplasia, probably from unrecognized or insufficiently treated insidious infection within the prostate.

Any condition that produces such serious effects on the urinary tract and on the general physical well being of the individual should stimulate the cooperation of the entire medical profession toward preventing patients from entering on the period of obstruction. This may be done by early recognition of infections within the prostate and by instituting the proper treatment for the correction. It is incumbent on the urologist to inform the members of the medical profession regarding the importance of eliciting and recognizing the initial signs and symptoms of obstructive lesions. They should be taught to inquire into the urinary symptoms of their male patients and to suspect obstruction in all cases of undue frequency, hesitancy or diminished force with a sensation of inability to empty the bladder completely. The presence of residual urine should indicate the necessity of a thorough urologic study. The absence of residual urine does not eliminate obstruction and, unless the symptoms can be explained by some other pathologic condition, a visual examination of the vesical orifice should be made.

If cases of obstruction are to be prevented from advancing to the stages at which it is now the rule rather than the exception to see them, the fallacy should be emphasized of relying on rectal palpation of the prostate to determine the presence of prostatic obstruction, as taught in medical schools, until the advanced symptoms of prostatism have supervened.

Until the present decade, the avenue of relief in the great majority of cases presenting obstruction has been through prostatectomy. This operation, being a major procedure, has deterred the patient with beginning obstructive lesions from seeking relief and caused the physician to use palliative measures until irreparable damage is done to the urologic and general systems of the individual.

Is it not reasonable to believe that, with the advent of an era of prevention in the potential stages of hypertrophy or, in the early cases, by checking with minor measures the advance of these cases to the extreme stages, the prospects of future patients with prostatic

* From the Crowell Clinic of Urology and Dermatology.
* Read before the Section on Urology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

diseases are greatly improved? In patients who for various reasons have been permitted to reach the stage of advanced obstruction, the better understanding of the effects on the upper urinary organs of the various obstructions, the improvement in the various laboratory methods of determining the amount of renal damage, the improvements in the application of remedial agencies for restoring the renal function to the maximum, the various refinements in anesthesia and operative technic —all these have greatly improved the prospects for these prostatic cases, regardless of the measures instituted for the correction of the obstructive lesions.

DEVELOPMENT OF PUNCH OPERATIONS

Within the past few years, improvements in the various methods of transurethral removal of obstructions at the vesical orifice, although far from perfect, permit the confident hope that an era of radical departure in the management of these obstructive lesions has arrived. To Caulk[1] must be given the credit for enlarging the scope of the admirable punch instrument of Young.[2] Caulk has demonstrated that with his instrument 85 per cent of all types of obstruction may be removed without resorting to major surgery. Stern,[3] for the introduction of the resectoscope, should receive credit for the invention of an instrument of greater possibilities in scope of operative removal of obstructive tissues. His instrument, although far superior to its predecessors, is far from perfect, and his technic also is an advance on that of earlier workers. The cutting current was extolled as ideal for severing tissue without hemorrhage. I[4] found this claim to be considerably exaggerated. The small size of the loop prolonged the operation; the lighting facilities were inadequate in the presence of hemorrhage, and there was no provision for the control of hemorrhage. The fragility of the loops originally supplied prevented the use of a coagulating current in the control of hemorrhage.

About five years ago I began the removal of vesical orifice obstructions with the resectoscope. During this time I have made numerous improvements in the original instrument[5] and have designed a special electromagnetic switch which permits instantaneous change from the cutting to the coagulating current and vice versa by the use of two foot switches,[5] which permit the removal of all types of prostatic obstruction by transurethral resection with every detail of the operation in plain view.

EXAMINATION OF PATIENTS

Examination by the cystoscope and operative and postmortem observations have demonstrated that it is the intravesical and intra-urethral encroachment of the gland that causes the obstructive features of prostatism. Experience gained during the past five years on more than 200 resections has convinced me that it is not necessary to remove the entire gland in order to relieve the patient's symptoms, it being necessary to remove only that portion producing the obstruction. With the resectoscope, it is possible to remove the entire gland completely under direct inspection and rectal palpation with the sheath of the instrument in situ. Excellent results have been obtained by limiting the operation to removing the obstructing tissue only.

1. Caulk, J. R.: Obstructive Lesions of the Prostate, J. A. M. A. 94: 375 (Feb.) 1930.
2. Young: Practice of Urology 2: 482.
3. Stern, Maximilian: Article read before Urological Section, New York Academy of Medicine, Jan. 20, 1926.
4. Davis, T. M.: J. South Carolina M. A. 24: 274 (Dec.) 1928.
5. Davis, T. M.: Urol. & Cutan. Rev. 35: 57 (Jan.) 1931.

PREPARATION OF PATIENTS

The cases treated by resection have had the usual complications concomitant with age and obstruction, varying in each case with the age of the patient and the degree and duration of the obstruction. The frequency, difficulty, dribbling, retention, incontinence and the general symptoms of uremia and circulatory embarrassment have been identical with those reported by surgeons who have resorted to enucleation for a cure.

The preparation for resection is that generally employed previous to the usual operations on obstructive conditions and is so well observed that a recapitulation seems unnecessary. Suffice it to state that the retention cases receive appropriate decompression; the renal function is restored to its maximum, and the cardiac and other complications receive appropriate treatment until the patient is in the best condition possible before any operative procedure is instituted.

It is an odd paradox that many operators who are perfectly willing to subject their patients to the two-stage suprapubic prostatectomy or to a suprapubic cystotomy prior to a perineal prostatectomy frequently ask me, "Can the largest prostatic hypertrophy be completely removed at one operation?" Why should any one demand that a procedure which is a minor operation and one without discomfort to the patient be limited to one sitting when he is perfectly willing to subject his patients to several operations which, to say the least, are very uncomfortable and require confinement to bed and chair for several weeks—and have a definite mortality risk?

Fig. 1.—Air cystogram showing large middle prostatic lobe.

In cases of extremely large bilateral lobes, the length of anesthesia may not permit the removal of the two lobes at a single operation, and then is required what I have termed a two-stage resection, i. e., the removal of one lobe at the first sitting and the other several days later. (Since the introduction of nupercaine this difficulty has been reduced to a minimum, as this drug produces an anesthesia of several hours' duration.) Patients requiring a second resection, having experienced no discomfort following the initial section, have

no hesitancy in submitting to additional resections; in fact, only 7 patients in this series of more than 200 have required morphine or other sedative following the operation. This should give some idea of the comfort of patients who have been operated on, as contrasted with prostatectomy. There has been no endeavor to establish any postoperative record and a standing order has been given for an opiate or hypnotic in all cases when necessary. Only the seven mentioned requested the drug.

COMPLICATIONS

Complications following resection have been surprisingly insignificant. There has not been a death following the operation in more than 200 cases as compared to a mortality of 4 per cent or higher for prostatectomy. There has been an elevation of the temperature from 99 F. to 103 F. in about 15 per cent of the cases; this usually subsided within forty-eight hours. A chill has preceded the elevation in eleven cases. Epididymitis has occurred in six cases, a percentage of less than 3. Preliminary vas ligation has not been employed.

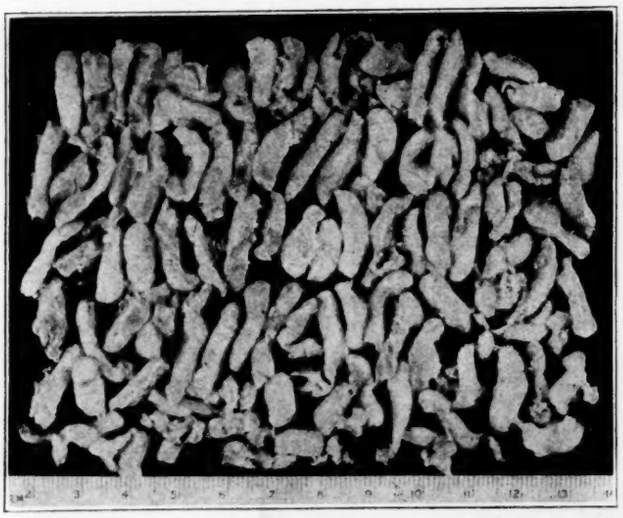


Fig. 2.—Tissue removed, weighing 24.7 Gm. and constituting the middle lobe, with resulting relief from obstruction.

HEMORRHAGE

The urine passed following resection is usually clear or slightly pinkish. In only one case has it been bloody. This was a case in which a carcinoma involved the vesical wall lateral to the prostate. During the operation it was observed that the bleeding was in an area to the left of the prostate which could not be reached with any instrument at hand. Suprapubic cystotomy was necessary to control the hemorrhage by direct coagulation. This afforded an excellent opportunity to examine the vesical orifice after a resection. In this case there was a cavity as large as a hen's egg; the cavity was clean and free from hemorrhage, and very little prostatic tissue remained around the cavity. Only one case of secondary hemorrhage has occurred; this on the tenth day following a 50 mile automobile ride. This hemorrhage was easily controlled by coagulation by the urethra.

HOSPITALIZATION

A few patients with small enlargements who lived in close proximity have not been hospitalized at all. The average stay in the hospital has been four days; the longest has been ten days after operation, except in the few instances that required the two-stage resection. The latter cases were dismissed under two weeks as compared with the lengthy hospitalization of prostatectomy.

RECURRENCE

Reoperation has been necessary in only seven cases (malignancy excepted) in which a two-stage operation was not anticipated at the initial operation. Six of these were the earlier cases in which sufficient tissue was not removed. This should have been expected with a pioneering operative procedure. During the past four years, not one patient in whom resection was done has required additional treatment for the relief of obstruction (malignant cases excepted). In eleven of the cases of resection, prostatectomy had been done from two months to three years before in which time obstruction had recurred; in four cases, relief has been required in from three to fifteen years.

POSTOPERATIVE EXAMINATION AND HISTORY

All patients are examined for residual urine and infection. A cystoscopic examination of the vesical orifice is made in all patients who will permit the procedure. Many object to this as they are comfortable and do not wish to undergo the ordeal. About 50 per cent of the patients have been observed for a period of three years. One patient died of pneumonia four months after the operation; two others have succumbed to diseases not related to the urologic tract. Three carcinoma patients have failed to answer a questionnaire; one of these I have learned is living three and a half years after the operation, and the other two presumably are dead. The other patients report that they are comfortable and comparatively free from urinary symptoms.

One hundred and six report that they have to void once a night. Thirty-eight report an occasional night voiding; twelve report that they void from twice to three times at night. The majority of the patients empty the bladder completely; no patient had a residual urine of over 2 ounces. Patients that have returned for a check had no increase in the residual urine and most of those with a slight residual urine shortly after the operation empty the bladder completely. The urine following resection in cases without preliminary drainage shows pus cells for several weeks; those with drainage have infected urine, which later, with adequate drainage, subsides in several months without treatment. Appropriate treatment in these cases will hasten the disappearance of the infection.

Classification of Cases in Which Resection was Performed

Type of Case		Number of Cases
Contracted vesical orifice		18
Median lobe		66
Unilateral and median lobe		30
Unilateral lobe		8
Bilateral lobes		42
Bilateral and median lobes		36
Carcinoma		30
Following prostatectomy:		
Perineal	4	
Suprapubic	12	
	—	16
Total		246

ANESTHESIA

Sacral or caudal block is the anesthesia of choice. This is produced by injecting 20 cc. of 3 per cent procaine hydrochloride or 1:1,000 nupercaine into the

sacral canal through a spinal needle placed within the sacral hiatus. Anesthesia is produced within about twenty minutes and with the latter drug is of sufficient duration for the most extensive resection. The only discomfort is due to overdistention of the bladder, which is immediately relieved by allowing the water to escape.

EQUIPMENT

The improved equipment used has been adequately described in an article by me.[6] The currents used are produced by an endotherm using pliotron tubes, which produce a radio current of great frequency, used for sectioning tissue. A current of lower frequency is produced by a diathermy generator, used in the control of hemorrhage. An electromagnetic switch by means of two foot switches activates either of these generators and directs the current to the proper electrodes of the resectoscope. The resectoscope consists of a sheath, size 26 F., with a fenestrum seven-eighths inch in length near the beak, an obturator to aid introduction, an indirect vision examining telescope, and the working parts. The working parts consist of a light carrier, water conduit, direct vision telescope and loop electrode. The loop is of special construction, specially insulated, and is attached to the working parts by means of a rack and pinion in such a manner that it can be made to traverse the fenestrum forward or backward. The loop is placed in front of the direct vision telescope and may be seen resting on the tissue protruding within the fenestrum prior to resection and may be observed throughout the entire excursion during the operation.

TECHNIC OF OPERATION

The patient, having received the sacral anesthesia, is placed in the usual cystoscopic position, with a six by eight inch tin-foil plate under the buttocks (inactive electrode); the proper wires from the magnetic switch are connected to this plate. The resectoscope is introduced through the urethra and the obturator removed; the bladder is irrigated with sterile water of low chemical content until the water returns clear. About 300 cc. of water is placed within the bladder, the observation telescope is inserted, and a careful examination is made of the vesical orifice and the posterior urethra. It is most important at this time to locate and recognize the verumontanum, as this is the anterior guide within the urethra. The site and amount of obstructing tissue to be removed is determined, the observation telescope is replaced by the working parts, and the proper conducting cords and water conduit are connected. The site of the initial section is selected and made to engage within the fenestrum (the initial sections are usually at the bladder margin). The cutting current is turned on by the foot switch (activating the electromagnetic switch). Observing the loop, bubbles will be seen to begin rising and a halo to form where the loop comes in contact with the tissue; the loop is slowly advanced the entire length of the fenestrum, removing a section of tissue 0.5 by 2.5 cm. and leaving a clean gutter. With the continuous irrigator turned on, the gutter is observed for a few seconds to determine the presence or absence of hemorrhage. If hemorrhage occurs, the foot is changed to the other foot switch (this activates the diathermy current), using about 600 milliamperes; with the diathermy current imposed on the loop it is slowly returned through the gutter; the diathermy current will be observed to follow the stream of blood coagulating the bleeding vessel with immediate control of the hemorrhage. The working parts are momentarily removed from the sheath and the tissue slightly adhering to the loop is easily shaken off into the drain pan. The working parts are returned and additional sections are cut, as previously described.

With median lobes and contracture of the vesical orifice, sufficient parallel lines of sections should be removed from the floor of the sphincter to remove the obstruction completely, permitting a clear view from the verumontanum along the gutter to the trigon of the bladder. With lateral lobes which encroach on the posterior urethra, numerous sections are removed from each lobe, beginning at the vesical aspect. Additional sections are made in a continuous line having the proximal edge of the preceding section in view at the distal edge of the fenestrum, 2.5 cm. of tissue being removed at each section. Sufficient parallel lines of sections are made in each lobe to remove the obstructing tissue,

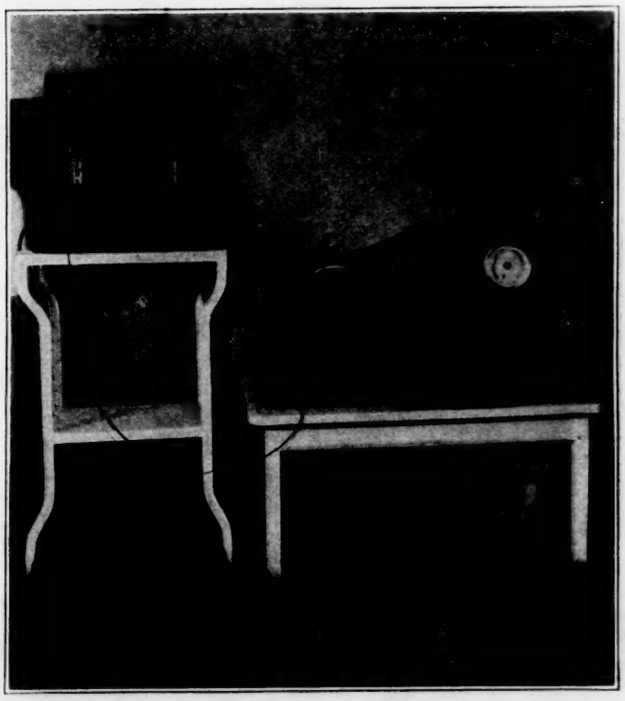


Fig. 3.—*A*, generator for cutting current; *B*, spark gap diathermy unit for producing coagulating current for the control of hemorrhage; *C*, author's electromagnetic directional switch for instantaneous interchange of the two currents used by means of the two foot switches, *D D*.

one lobe being resected at a time. For orientation within the urethra, the verumontanum is used as the anterior guide; it is always at the apex of the prostate (except in a malignant growth that has broken through the capsule). With a gloved finger within the rectum and the sheath of the instrument within the urethra, any remaining prostatic tissue may be palpated and removed if desired.

On completion of the resection, all bleeding points are located and coagulated as described previously, leaving the operative field free from the slightest hemorrhage as determined by the return of clear irrigating fluid. The resectoscope is removed and a 16 F. soft rubber catheter is left in situ and is connected to a tube for drainage into a bottle attached to the side of the bed. In patients who require a second operation, the retention catheter remains until this operation is to be done; in others it is removed in forty-eight hours, when they are able to void a large forcible stream without discomfort.

6. Davis, T. M.: Urol. & Cutan. Rev. **35**: 57 (Jan.) 1931.

Patients are usually dismissed from the hospital from twenty-four to forty-eight hours after the catheter is removed, with instructions to report at intervals for inspection.

Tissue removed by resection is not seriously changed histologically and is examined as a routine for evidence of malignancy, and the like, both by frozen section and in paraffin blocks. A number of the sections cut by the loop are mounted in the permanent paraffin blocks so as to give a thorough examination of the tissue removed.

In cases with a preoperative diagnosis of malignancy, sufficient tissue is removed to give as large an opening as possible, and the entire surface sectioned is coagulated with diathermy. Radium element or the required number of emanation seeds are implanted through the perineum within the growth around the orifice. In every case of malignancy it has been possible to restore to these unfortunates the ability to empty the bladder through the natural passage without the discomfort and inconvenience of the permanent suprapubic drainage. All these patients have resumed their usual vocations, which drainage would have prohibited.

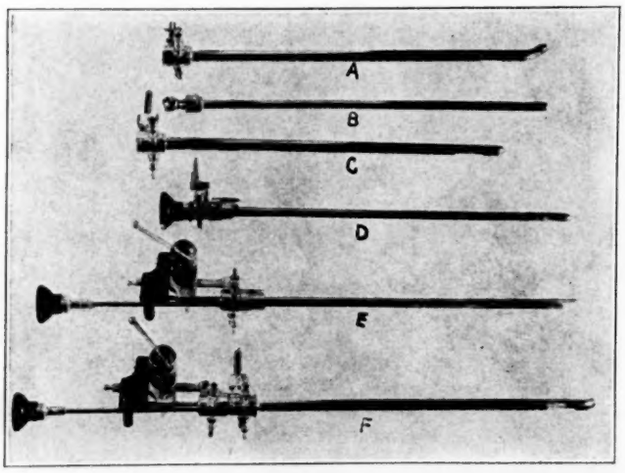


Fig. 4.—Author's improved resectoscope equipment: *A*, original Stern's sheath with long beak and five-eighths inch fenestrum; *B*, obturator; *C*, author's sheath with short straight beak and seven-eighths inch fenestrum with d pth three-fifths that of sheath; *D*, observation right-angled telescope; *E*, working parts; *F*, instrument assembled.

The following cases selected from the series will be reported briefly:

CASE 1.—*History.*—B. F. K., a man, aged 78, had complete retention for ten days, relieved by intermittent catheterization. His general condition was poor; the blood pressure was 210 systolic and 100 diastolic. The heart was enlarged generally; there was a systolic murmur transmitted to the axilla. Nonprotein nitrogen was 85 mg. per hundred cubic centimeters. Excretion of phenolsulphonphthalein, 20 per cent, in one hour followed intravenous injection. Rectal palpation revealed large bilateral hypertrophy. Cystoscopic examination revealed large intravesical bilateral and middle lobes; seven small calculi in the bladder; 32 ounces of residual urine; chronic cystitis, and marked bladder rugae. Gradual decompression was instituted for six weeks with the usual treatment to restore urinary and cardiac function.

Resection.—Stones were removed with the rongeur; the lateral and middle lobes were removed in three hours and ten minutes. The retention catheter was removed in forty-eight hours and the patient voided a large forcible stream. He was discharged from the hospital on the third day. Convalescence was uneventful. Two months after the operation the patient completely emptied the bladder; the urine is free from infection. He is in excellent health at the present time, considering his age and heart condition, which is adequately compensated, and he is free from urinary symptoms.

CASE 2.—*History.*—H. J., a man, aged 67, Negro, a laborer, was admitted to the hospital in a moribund condition; the lower extremities and the scrotum were markedly edematous; there was marked dyspnea; the patient was semiconscious. The blood pressure was 220 systolic and 110 diastolic; there was complete retention. Nonprotein nitrogen was 78 mg. per hundred cubic centimeters; creatinine, 3.5 mg. Gradual decompression by urethral catheter was instituted. Dextrose was given intravenously; forced fluids and alkalis were given. The patient reacted well. One week after admission, rectal palpation revealed a large prostate of firm consistency, not nodular and with no areas of stony hardness. Cystoscopy revealed great bilateral and median lobe enlargement and the bladder chronically inflamed.

Resection.—The lateral and median lobes were removed, the operation requiring two hours and fifty minutes. Tissue examination revealed prostatic hyperplasia. The retention catheter was removed in forty-eight hours; the patient voided a large forcible stream. Convalescence was uneventful. The patient was discharged from the hospital on the fourth postoperative day. One month after operation the patient reported no night voiding. The urine was free from infection. There was no residual urine. Sexual function was normal for his age. He has been working as a laborer since two weeks after the operation. Two and one-half years after the operation the patient is free from urinary symptoms. At this time cystoscopic examination revealed a large fossa where the prostate was removed. There was no evidence of urethral encroachment or contracture of the tissue due to resection. Three years after operation the patient is in excellent condition.

CASE 3.—*History.*—R. S. M., aged 51, a physician, has had complete retention for the past three years. He was informed at one of the large national clinics that he had a cord bladder. At another he was told that the clinicians did not think that it was a cord bladder as the blood and spinal fluid Wassermann reactions had remained persistently negative. There is a negative syphilitic history. The blood pressure was 130 systolic and 90 diastolic. Nonprotein nitrogen was 33 mg. per hundred cubic centimeters. The excretion of phenolsulphonphthalein was 66 per cent in two hours. The patient had a complete retention and was offered no relief other than by catheterization, which he had resorted to three times in twenty-four hours for the past three years. Rectal palpation revealed a very small prostate with no evidence of enlargement. Cystoscopic examination revealed a bladder with fine trabeculations and a chronic cystitis; a diverticulum opened to the left of the midline; the lateral lobes of the prostate were not enlarged; there was a small bar formation in the floor of the urethra.

Resection.—The median bar was resected in twenty minutes. Tissue examination consisted of fibromuscular elements. The retention catheter was removed in forty-eight hours; the patient voided a large forcible stream without effort, completely emptying the bladder. The patient was discharged from the hospital twenty-four hours after the catheter was removed. He is delighted with his condition and is free from urinary symptoms.

CASE 4.—*History.*—W. M. W., aged 68, a retired farmer, had had a suprapubic prostatectomy six years before. His general condition was good. He voided for six months after the operation; he had worn a retention catheter for about five years rather than submit to another prostatectomy. Rectal examination revealed a large prostate, not nodular, with no areas of stony hardness. Cystoscopy revealed large intravesical bilateral lobes with a deep notch between the lobes. The posterior urethra was tortuous and the landmarks were absent.

Resection.—The lateral lobes were removed in two hours and forty-five minutes. Tissue examination revealed prostatic hyperplasia. The retention catheter was removed in forty-eight hours; the patient voided a large forcible stream without difficulty, exclaiming, "Ponce de Leon looked for the fountain of youth and here it is." Convalescence was uneventful. The patient was discharged from the hospital twenty-four hours after the catheter was removed. One month after operation the

patient reports that he voids once at night; the urine is free from infection and there is no residual urine. One and a half years after operation the patient reports that he is free from urinary symptoms and is in excellent health.

CASE 5.—*History.*—W. E. P., aged 68, a minister, had had complete retention for two months. His general condition was fair. Intermittent catheterization was being used. Rectal palpation revealed a large stony hard prostate with extension on the left lateral wall of the pelvis. A roentgenogram did not show metastases to the bones or lungs. The patient had sciatic pain in the left leg of three months' duration. Cystoscopy revealed a large bilateral nodular carcinoma of the prostate, with chronic cystitis.

Resection.—The lateral lobes of the prostate were removed, the resection being extended well into the urethra. Tissue examination revealed adenocarcinoma. Radium was applied by rectum to the prostate and the lateral wall of the pelvis, 1,200 millicurie hours in divided doses. High voltage roentgen therapy in a series of doses was given by Dr. DeWitt Klutz. The retention catheter was removed on the fifth day; the patient voided a fair stream. One month after operation the patient voided once during the night; the urine showed pus cells; no organisms were present in stained smears. The residual urine was less than 1 ounce (30 cc.). The patient was relieved of the sciatic pain. He resumed his activities in supplying the pulpit. Three years after operation the patient failed to answer the questionnaire. Information received from another patient is that he has a neurologic disturbance of the lower extremities. He voids urine through the natural passage without resorting to a catheter.

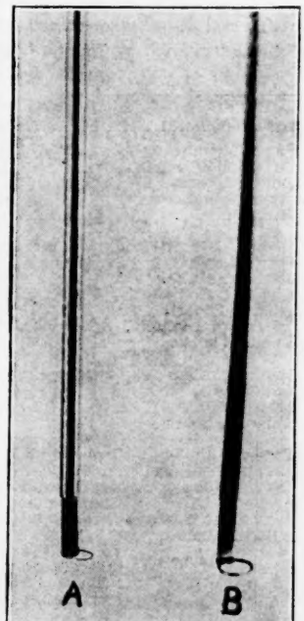


Fig. 5.—*A*, size of original loop; *B*, size of loop used by author. Reinforced angle of loop wire is shown.

CASE 6.—*History.*—J. F. McK., aged 65, a mill president, complained of frequency, especially at night. His general condition was excellent. The blood pressure was 140 systolic and 85 diastolic. The patient voided from four to six times during the night. Rectal palpation revealed a slightly enlarged prostate, not nodular or indurated. The secretion was normal. There was no residual. The urine was normal. The phenolsulphonphthalein test resulted in return of 65 per cent one hour after intravenous injection. Cystoscopy revealed normal bilateral prostate lobes; there was a slight median bar with inflammation of the floor of the sphincter. The bladder was normal.

Resection.—The bar was completely removed, leaving a clear gutter from the verumontanum to the trigon. The retention catheter was removed in twenty-four hours. The patient voided a large forcible stream. He was discharged from the hospital in three days after the operation. Convalescence was uneventful. The patient voided twice nightly immediately following the operation. One month after operation the patient is free from urinary symptoms, does not have to void during the night, and the urine is normal. The patient is delighted with the results.

This case was reported to show the importance of correcting the early slight obstructions that disturb the normal rest of the individual.

CASE 7.—S. K., aged 50, had nothing of interest in his family history. June 15, 1930, he was operated on for a large vesical calculus; other than this, his past history was negative. The patient entered the Crowell Clinic with a suprapubic wound draining as a result of the operation. He had no complaint other than this. On examination, 16 ounces (473 cc.) of residual urine was found.

Resection.—A retention catheter was promptly placed in the urethra and later cystoscopy revealed a rather large median lobe. The patient's general condition improved rapidly and on Feb. 4, 1931, prostatic resection was done, and the patient's condition improved immediately. This patient for months had from 16 to 20 ounces (from 473 to 591 cc.) of residual urine. After operation he could empty his bladder completely. Two months after operation he is still emptying his bladder completely with no discomfort whatever and with no symptoms of prostatic trouble.

SUMMARY

Early recognition and treatment of infection of the prostate are urged to prevent obstructions.

Recognition of early obstructions and their correction by transurethral methods will lessen the number of advanced cases of prostatism.

Prostatectomy, previously being the avenue offered, deterred many from seeking relief early, before irreparable damage to the urinary and other organs had occurred.

Resection reduces the removal of the obstructing prostate to a minor surgical operation with the accuracy of a cystoscopic procedure and permits operation in the minutest detail under direct vision.

Resection reduces the hospitalization to several days as compared to several weeks for prostatectomy with its economic consideration.

In bars and contractures, for accuracy and ease of operation, resection excels any method previously described. In these conditions there is no excuse for more radical measures.

In the large hypertrophies that require one or more resections, with its freedom from mortality and discomfort to the patient it should be the method of choice, as these conditions can be corrected without resorting to major surgical procedures.

In inoperable carcinoma, relief by resection is to be recommended over permanent suprapubic drainage.

Findlay Building.

[EDITORIAL NOTE.—This paper, together with the paper of Drs. Lowsley and Kirwin, which precedes it, and the papers of Drs. Edwin Davis and A. H. Peacock, to appear next week, constitute a symposium on prostatectomy. The discussion will follow the papers to be published next week.]

The Meaning of Life.—The mark of all true "meanings of life" is that they are common meanings—they are meanings in which others can share, and meanings which others can accept as valid. A good solution of the problems of life will always clear the way for others also; for in it we shall see common problems met in a successful way. Even genius is to be defined as no more than supreme usefulness: it is only when a man's life is recognized by others as having significance for them that we call him a genius. The meaning expressed in such a life will always be, "Life means—to contribute to the whole." We are not speaking here of professed motives. We are closing our ears to professions and looking at achievements. The man who meets the problems of human life successfully acts as if he recognized, fully and spontaneously, that the meaning of life is interest in others and cooperation. Everything he does seems to be guided by the interest of his fellow beings; and where he meets difficulties he tries to surmount them only by means consonant with human welfare. . . . If we look around us today at the heritage we have received from our ancestors, what do we see? All that survives of them is the contributions they have made to human life.—Adler, Alfred: What Life Should Mean to You. Boston: Little, Brown & Co., 1931.

CARCINOMA OF CERVIX UTERI

REPORT OF ONE THOUSAND FIVE HUNDRED AND SEVENTY-FOUR CASES *

WILLIAM P. HEALY, M.D.
NEW YORK

To the late Dr. Harold Bailey belongs the credit for organizing and establishing the department of radiation therapy in the gynecology clinic at the Memorial Hospital. Bailey began his work with radium in 1915 and remained in charge until the fall of 1921.

In those first years the work was of necessity largely experimental; types of applicators and methods of approach had to be developed, and as a rule only advanced cases were treated. Moreover, much time was spent in studying dosage and tissue reactions to radium. During those years, the low voltage x-ray machine was available for roentgen therapy but was not utilized. Dependence was placed on radium alone.

By 1918 a working plan had been developed which consisted in the use of radium applied to the cervix in four ways: (*a*) vaginal, (*b*) intracervical and intra-uterine, (*c*) external, by the use of a radium block at 4 cm. in six positions about the pelvic circumference, and (*d*) unfiltered glass radon seeds for interstitial irradiation.

In this way Bailey brought into effect and established at the Memorial Hospital the so-called cross-fire principle of radiation therapy in carcinoma of the cervix.

Under this plan the lesion in the cervix and the lymphatic drainage area leading from the cervix, through which metastases might be expected to spread to adjoining tissues or to distant parts, were subjected to radiation in as heavy dosage as could be given without destroying the integrity of the normal structures. Moreover, Bailey established the plan also of giving a large dose of radium, thereby finishing the course of treatment in a short time. This was known as the massive dose method of treatment, as distinguished from the continuous application of a small quantity of radium for five days or more, according to the method followed by Regaud in Paris, or the divided treatment method of Forssel and Heyman in Stockholm, in which a series of three treatments with radium is given within four weeks, with an interval of one week between the first and the second treatments and two weeks between the second and the third treatments.

Since 1918 all primary metal filters used by us at the Memorial Hospital have been equivalent to 2 mm. of brass, but for intracervical and intra-uterine use they are made of a mixture of gold and platinum, 0.5 mm. thick, and have from 1 to 2 mm. of black rubber outside the metal. In vaginal applicators, brass is the metal used for filtration on the treatment surface. For interstitial radiation, small gold radon tubes with a filtration of 0.3 mm. of gold are used.

The cross-fire principle of technic established by Bailey is still in use at the Memorial Hospital as well as the massive dose plan by which all major radium treatments are finished as a rule within a time period of seventy-two hours.

As our experience has increased, certain changes in technic have gradually evolved (table 1). For instance, in December, 1921, radium for external irradiation of the pelvis was replaced by low voltage x-rays and a pelvic cycle of four exposures was given.[1] This change was made after conferences with the biophysical department, in which it was demonstrated that 10 cm. below the skin surface, which is equivalent to the midpoint of the average female pelvis, a greater percentage of effective radiation could be obtained with the low voltage x-ray machine than was obtained with the radium block then in use.

Throughout 1922, 1923, 1924 and 1925, all cervix cases were treated with radium applied (*a*) within the vaginal tube against the cervix, (*b*) within the cervical and uterine canals, (*c*) with unfiltered glass radon seeds buried in the outer margins of the cervical lesion, and (*d*) with a low voltage x-ray cycle from one to two weeks later.

In 1926 the unfiltered glass radon seeds for interstitial treatment were replaced by gold seeds or tubes of 0.3 mm. gold filtration, thereby doing away with the soft beta ray effect and obtaining a more uniform gamma radiation. High voltage x-ray machines with a peak voltage of 200 kilovolts replaced the low voltage machines previously in use; this change again increased the effective radiation obtainable throughout the deeper portions of the pelvic field.

TABLE 1.—*Changes in Technic of Radiation Therapy in Carcinoma of the Cervix at the Memorial Hospital from 1918 to 1930, Inclusive*

1918-1919-1920-1921	1922-1923-1924-1925	1926-1927-1928	1929-1930
Vaginal bomb 1,000 to 3,000 millicurie hours 2 mm. of brass filtration	Same	Vaginal applicators of various designs and shapes; dosage and filtration same as before	Same
Cervical and uterine capsules, 1,500 to 3,000 millicurie hours, 0.5 mm. of platinum, 1 mm. of rubber	Same	Same but filtration changed to 0.5 mm. of gold and 1 mm. of rubber	Same
Unfiltered glass radon seeds, 200 to 2,000 millicurie hours	Same	Replaced by gold radon seeds, 0.3 mm. filtration	Omitted from primary treatment but may be given later
External application of radium in 6 positions around pelvis for 9,000 to 18,000 millicurie hours	Replaced by low voltage x-rays, 4 mm. of aluminum filtration, 30 cm. T.S.D. 140 kilovolts and 60 milliampere minutes; 4 fields surrounding pelvis	Replaced by high voltage x-ray cycle: 200 kilovolts, 0.5 mm. copper, 2 mm. aluminum filtration; 50 cm. T.S.D.; 12×10 field; 240 to 360 milliampere minutes; 4 fields	Same but given before application of radium in all but the earliest cases

The next important change in technic was instituted late in 1928.[2] It had become almost a routine procedure for us to use interstitial radiation in almost every case, in order to reinforce the surface applications of radium at the time of the first treatment. The total interstitial dosage applied by means of gold filtered radon seeds varied from 200 to 2,000 millicurie hours, according to the extent of the lesion.

A critical study of end-results in many of these cases led us to the conclusion that too many apparently favorable cases were not doing as well as had been anticipated, in fact seemed to show unusually rapid extension of active and uncontrollable cancer metastases, especially in the retroperitoneal lymph glands. It seemed to us that this could readily be caused by the trauma associated with the introduction of seeds or needles into viable cancer tissues, thereby opening up the perivas-

* From the Memorial Hospital.
* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

1. Bailey, Harold; and Healy, W. P.: Am. J. Obst. & Gynec. 6: 402 (Oct.) 1923.
2. Healy, W. P.: Ann. Surg. 93: 451 (Jan.) 1931.

cular lymphatics, as well as the vessels themselves, to invasion with actively growing cancer cells which were quickly carried beyond the effective range of the radium rays; and despite the fact that the primary lesion was completely cured the patient in many instances did badly because of the unexpected and rapid growth of these metastases. Because of this impression we decided to make two changes in our technic: first, to omit interstitial irradiation with seeds from our first series of radium treatments and, second, to give the high voltage roentgen cycle of four exposures before the radium applications in all but the earliest and most favorable cases.

As two out of three of our cases present lesions which are well established, ulcerated and more or less infected when first seen, it seemed to us that this preliminary roentgen irradiation would tend to shrink down the lesion and get rid of the softer, friable, infected surface, especially with the coincident use of warm antiseptic douches, and to create thereby a more favorable setting for the radium. Our experience with this procedure during 1929, 1930 and 1931 to date would seem to indicate that this conclusion is correct, for the lesions have become smaller and cleaner under this treatment, and when the patient is treated with radium, about ten to fourteen days after the first roentgen treatment, regression has already started and the radium applicators can be placed closer to the more actively growing central part of the cancer. As many of the lesions are radiosensitive, the regression from the roentgen therapy in such cases is quite striking, so much so that in the very advanced or so-called group 4 cases, in which only palliation is hoped for, two or three roentgen cycles, six weeks or so apart, may be given with advantage, and little or no radium is used in such cases. As interstitial radiation is not now used as part of the primary treatment, vaginal applicators of different sizes and shapes have been devised in order completely to cover and irradiate the vaginal surface of the lesion at the first series of radium treatments.

Interstitial radiation in the form of gold filtered radon seeds is reserved for use, from four to eight weeks after the primary treatment has been finished, in any residual part of the original lesion that is not regressing satisfactorily. It is interesting to note, however, that we are using this form of treatment less and less and tend to depend, even in these cases, more on surface application of radium. If one desires to use the cautery for the removal of large cauliflower lesions, it is a good plan to sterilize the lesion first with a high voltage roentgen cycle, followed by implantation of gold seeds or needles before using the cautery. At the present time we have a very useful and practical endothermic wire snare for the removal of these lesions and we rarely use the cautery.

RETREATMENTS

In reviewing all our primary cervix cases, 1,574 in number, from 1918 to date, it is interesting to note that only 11.4 per cent of these cases required further radiation therapy with radium after the primary series of treatments had been given (table 2). The proportion of early cases requiring such treatments was 5 per cent, borderline cases 13.7 per cent and advanced cases 12 per cent. Only two of these patients survived more than three years after the secondary series of treatments. This verifies the experience of the majority of clinics in which large numbers of cases have been treated by radiation therapy, that a lesion or area of the body once fully and adequately irradiated for carcinoma cannot again be treated to advantage with radium or roentgen therapy. Irradiation leads to tissue changes, largely in the nature of endarteritis and fibrosis, and further irradiation of such structures results in the formation of indolent chronic ulcers and sloughs, which are painful and extremely difficult to heal. Such ulcers are often confusing to those of limited experience and are regarded by them as an evidence of active cancer growth.

It is obviously desirable not to irradiate a suspected recurrence unless a biopsy finding indicates that it is cancer.

Ward and Farrar,[3] in a review of their cervix cases treated according to their method by intracervical capsules and needles, no vaginal application of radium and no roentgen therapy being used, report that approximately 50 per cent of all their patients have required retreatments with radium for local recurrences in or about the cervix or in the vaginal walls and that about 26.5 per cent of these retreated patients have survived for five or more years. They are of the opinion from their experience that retreatments are feasible and valuable. In commenting on this interesting and unusual report in the light of our own experience and that of others, one would be inclined to think that the large number of local recurrences and high percentage of retreatments necessary were an indication of insufficient and inadequate primary treatment. Substantiation of this conclusion would appear to be given by the fact that 26.5 per cent of their retreated cases responded to further radiation therapy, indicating that they were still radiosensitive and therefore that such tissues could not have been previously adequately irradiated.

TABLE 2.—*Retreatment of Carcinoma of Cervix*

Clinical Group	Total Cases	Retreated	
		Number	Per Cent
Early	197	10	5.0
Borderline	190	26	13.7
Advanced	1,187	144	12.0
Total	1,574	180	11.4

One recognizes that isolated metastases appearing in a section of the vaginal tube or rectovaginal septum not previously irradiated may be expected to respond to radiation therapy. Unfortunately, such local metastases seldom are seen without additional or associated metastases deeper in the parametrial tissues or retroperitoneal area, so that, despite the response of the vaginal metastasis to radiation, the life of the patient is not materially prolonged.

It may be said, then, that our experience coincides with that of the majority of investigators that the application of further radiation to lesions once fully irradiated is useless and inadvisable, if not dangerous. If the primary lesion does not respond satisfactorily to treatment but indicates by its lack of response that it is radioresistant, we believe that panhysterectomy should be promptly done if the case is favorable for such a procedure.

This operation will permit complete healing of the vaginal vault and may protect the patient from further local ulceration with annoying discharge and hemorrhage.

3. Ward, G. G., and Farrar, Lilian K. P.: Paper read before the American Gynecological Society in May, 1931.

Histologically, 97.3 per cent of our cases were squamous epidermoid carcinomas and 2.7 per cent were glandular or adenocarcinomas. Additional cases were reported by the pathologist as adenocarcinoma, but a careful histologic and clinical study indicated that the cases in this group were of endometrial origin and represented secondary cervical involvement complicating primary carcinoma of the corpus (table 3).

Since the advent of radiation therapy in the treatment of carcinoma of the cervix, it is now generally recognized that the squamous epidermoid cancers can be subdivided into three groups, according to variations in histologic characteristics indicated by different degrees of cellular anaplasia, and that the radiosensitivity of these groups will vary with the degree of anaplasia present.[4]

The more fully developed the cancer cell and the less the degree of anaplasia the more radioresistant the lesion will be, whereas the more embryonal the type of cancer cell and the greater the evidence of anaplasia present the more radiosensitive the lesion may be expected to be and the more satisfactory the response to radiation therapy. In general, it may be said that about 20 per cent of all cases of squamous cancer of the cervix tend to be radioresistant. The remaining 80 per cent will vary in radiosensitivity depending on the relative proportion of adult, transitional or embryonal types of cells present.

The response to radiation therapy is also affected by the extent of the lesion as regards infiltration or destruction of normal tissues, amount of infection present, ability of the local tissues to respond to treatment, and the general condition and constitutional reaction of the patient.

A small number, about 15 to 20 per cent, will be quite responsive to irradiation, so that even advanced cases in this very radiosensitive group do much better than one expects.

Because of the now recognized tendency to radiosensitivity in such a large number of our cases of carcinoma of the cervix, we have deemed it desirable to treat all but the most favorable of our cases first with high voltage roentgen rays before applying radium.

TABLE 3.—*Carcinoma of Cervix Uteri*

	No. of Cases	Per Cent
Squamous epidermoid carcinoma	1,531	97.3
Adenocarcinoma	43	2.7
Total primary cases, 1918 to 1930 inclusive	1,574	

Certain interesting observations have been made. When the follow-up notes on a case indicate that there has been no noticeable response to the roentgen cycle, we have found that it has also failed to respond as fully as was expected to subsequent radium treatment, and such patients often fail to live as long as the original clinical grouping indicated should have been the case. We are inclined to believe that clinically early or favorable cases of this radioresistant type should be treated by simple panhysterectomy from four to six weeks after full radiation treatment.

Conversely, quite advanced cases which happen to respond unusually well to the roentgen treatment and in which before treatment only temporary palliation had been expected may then be treated to their further advantage by vaginal or even intracervical applications of radium.

I believe that in these ways and by using it before treatment with radium, high voltage roentgen therapy enlarges tremendously the field of usefulness of radiation therapy in carcinoma of the uterine cervix and permits a broader approach as well as greater differentiation in the treatment of individual cases. I do not believe that it is possible to do full justice to all the cases in a large clinic without the complete cooperation of a well organized roentgen department.

Under the present plan of treatment as outlined, complete primary healing is obtained in from four to eight weeks. If at the end of this time active disease is still evident in the cervix, it is doubtful whether the patient will do well under radiation therapy.

TABLE 4.—*Adenocarcinoma of Cervix from 1918 to 1930, Inclusive*

	Total	Per Cent	Alive Jan. 1, 1931	Duration of Life	Average
Early	5	25	5	1 to 10 yrs.	3.6 yrs.
Borderline	6		4	1 to 12 yrs.	4.9 yrs.
Advanced	13	75	8	1½ to 10 yrs.	4 yrs.
Palliative	19		0	3 to 36 mos.	12.5 mos.

There is a general belief, judging from the opinions expressed by various writers, that primary adenocarcinoma of the cervix is quite radioresistant and therefore offers a bad prognosis. In a recent article reviewing all the cases of carcinoma of the cervix observed at the gynecologic clinic of the University of Freiburg from 1915 to 1925, Keller[5] concludes that adenocarcinoma of the cervix is rather rare. He states that the incidence was 2 per cent in their clinic and in no case was there a permanent cure, the average duration of life being 15.4 months.

It is interesting to review the end-results in our cases of adenocarcinoma, forty-three in number, or 2.7 per cent of the total series. The incidence is rare, as already noted. Clinically subdivided, there were five early, six borderline, thirteen advanced and nineteen very advanced cases. One notes that there are eleven favorable cases, or 25 per cent, and 32 unfavorable cases, or 75 per cent. These figures correspond exactly with those obtained for the whole group of cervix cases (table 4).

However among the early cases all the patients are alive, one of them for ten years, but this patient for the past year has had symptoms due to active disease about the vaginal tube and in the parametrium. Two patients are living and well, each for three years, and two patients for one year each. Of the six borderline patients, four are alive and well, one each for one year, three years, five years and twelve years, two are dead, one nine months after the radiation therapy but as a result of complications following a Wertheim hysterectomy; the other lived seven and one-half years after her treatment but died from active recurrence of cancer in the pelvis.

In the advanced group, none of the patients died in less than two years; one lived six years and finally died from cancer. Eight of the thirteen patients in this group are still alive and well for periods varying from one and one-half to ten years.

4. Healy, W. P., and Cutler, Max: Am. J. Obst. & Gynec. **19**: 457 (April) 1930.

5. Keller, F.: Die Prognose des Adenokarzinoms des Collum uteri bei Strahlenbehandlung, Strahlentherapie **37**: 349-353, 1930.

In the very advanced group, in which treatment was regarded only as palliative, the duration of life varied from three to thirty-six months; the average for the nineteen cases in this group was twelve and one-half months. The unusually large proportion of very advanced, or group 4, cases requires some comment. In our opinion, it is probably due to the fact that the lesion begins in the substance of the cervix and infiltrates extensively before ulceration and associated discharge occur and draw the patient's attention to the disease. The end-results in this series of forty-three cases of adenocarcinoma of the uterine cervix would indicate that the lesion does respond to radiation therapy, as nine of the patients lived from five to twelve years.

Clinical grouping of cases (table 5) as early, borderline, advanced, and so on is a personal matter and as such will vary tremendously with the personal reaction of different individuals to the problem.

In the Mayo Clinic, Bowing and Fricke [6] in 1,261 cases placed only 2 per cent in the favorable or early and borderline group. Crossen [7] reports 2.5 per cent, Lynch [8] 27 per cent, Schmitz [9] 21.4 per cent, and in our cases the ratio was 24.5 per cent. This variation in grouping is interesting and tends to indicate the unreliability of statistics bearing on end-results in only a portion of the total number of cases treated.

Absolute cures, figured on the total number of patients observed and treated and the number living at the end of five years, are much more dependable, and it is interesting to observe that they are quite uniform as regards carcinoma of the cervix, regardless of the clinic or country from which they are reported. Also, the total salvage is the same whether the treatment is by operation or radiation therapy, and approximates from 20 to 22 per cent, as shown in the chart.

PROGNOSIS

The prognosis depends on the age of the patient, the clinical stage of the disease, the histologic classification of the tumor and the choice of treatment. Very few patients in whom the disease develops under 30 years of age survive five years. The smaller the lesion and the more localized the disease to the portio vaginalis, the better the prognosis.

TABLE 5.—*Clinical Classification of Carcinoma of the Cervix Uteri*

	No of Cases	Per Cent	Five Year Cures*
Early	197	12.5	55.0%
Borderline	190	12.0	34.6%
Advanced	1,187	75.5	15.0%
	1,574	100.0	

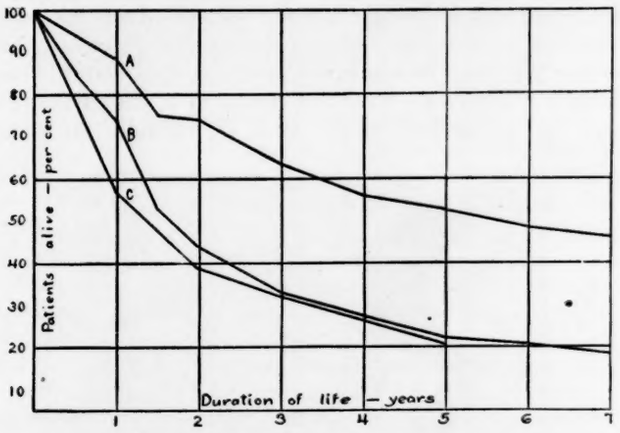
* Absolute five year cures, all cases, amounted to 22.5 per cent.

The more embryonal the cellular structure of the lesion and the greater the degree of anaplasia, the more radiosensitive the lesion will be and the better the prognosis under radiation therapy.

Under surgical treatment, on the other hand, this type of lesion gives a bad prognosis, as it is highly malignant and rapidly invades the perivascular lymphatics.

Pain is a bad symptom and when referred to the hips and thighs is usually an indication of incurable disease, located in the retroperitoneal glands and causing pressure on nerves. It is often present in severe form for months before any gross evidence of the metastasis can be detected.

Rectal distress due to radiation proctitis is extremely common in the first month following the treatment. It rarely persists longer and seldom results in ulceration. It is readily controlled by a restricted diet, bismuth preparations and opium by mouth, and small olive oil rectal injections.



Curves showing average duration of life with radiation therapy and with radical hysterectomy combined with radiation therapy, either preoperative or postoperative: *A*, early cases (Memorial Hospital); in these cases radiation therapy alone, consisting of radium and roentgen rays, was used. *B*, all cases (Memorial Hospital); in these cases radiation therapy alone was used. *C*, all cases (University of California); in these cases radical hysterectomy was combined with preoperative or postoperative irradiation.

Bladder symptoms are less common following the primary treatment but are seen in a small number of cases a year or so later. When seen at this time they are regarded as due to late secondary changes in the bladder mucosa from radiation endarteritis and fibrosis with loss of nutrition to the affected part, resulting in the formation of a local trophic ulcer or ulcers. Such a lesion causes severe dysuria and responds very slowly to treatment, which consists of the usual bladder sedatives, irrigations of boric acid solution and instillations of mercurochrome-220 soluble or of mild silver protein.

CONCLUSIONS

Unfortunately, a cure for carcinoma of the cervix uteri has not yet been obtained.

Only from 20 to 22 per cent of all patients treated survive five years, regardless of the method of treatment employed.

The best results are obtained by early diagnosis, followed by prompt and efficient treatment. Sixty per cent or more of the early cases may be cured for five or more years.

Radiation therapy has not yet been stabilized and must be regarded as still in the experimental period. Marked variations in technic and principles of treatment exist in different clinics but, strange to say, the end-results are quite similar.

On the whole, in the treatment of cervical cancer, radiation therapy seems to have a greater field of usefulness than surgical treatment and offers more relief from symptoms and greater prolongation of life to a larger number of the patients.

121 East Sixtieth Street.

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THE RECOGNITION OF CANCER OF THE UTERUS IN ITS EARLIER STAGES *

FRED EMMERT, M.D.
ST. LOUIS

By far the greatest percentage of cases of cancer of the cervix uteri is diagnosed only when the disease is already more or less far advanced. Even in the so-called early cases, the pathologic process is quite well established and has made some inroads. The consensus is that the outlook for the patient improves, the earlier the stage in which the cancer is discovered. One must try, therefore, to detect cancer at a still earlier, in fact, at its earliest stage, and, if possible, go even beyond this to the precancerous condition which may give rise to malignant degeneration. Of such precancerous conditions which are potentially dangerous, several are known; for instance, cervical tears, erosions, eversions and leukoplakias. The last named condition, although its relation to cancer of the cervix has been known through von Franqué and others for more than thirty years, has received far too little attention on the part of the profession, probably because it was difficult to see these leukoplakias.

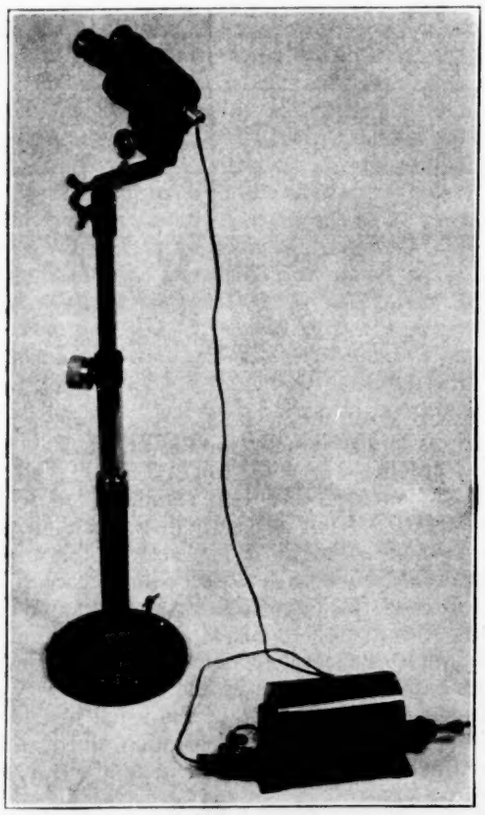

Fig. 1.—The colposcope.

A leukoplakia is a disorder of certain mucous membranes and is characterized by an increased formation of keratin in the superficial layers of the squamous epithelium and a marked hyperplasia of all other constituents of the mucous membranes until the latter closely resembles the epidermis in microscopic appearance. These changes result in the production of bluish, pearly or grayish white plaques, which are either level with the surrounding mucosa or slightly raised if the hyperplastic process has been excessive. Leukoplakia is most often found on the oral and vulvar mucosa, but also, though less frequently, in higher parts of the vagina and on the cervix.[1]

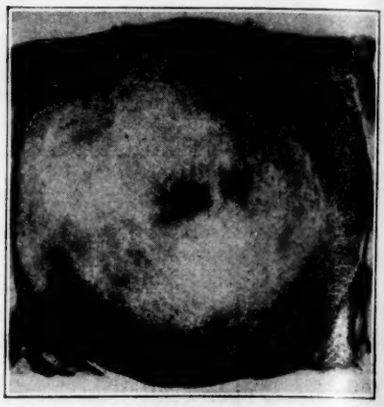

Fig. 2.—Virgin portio.

THE COLPOSCOPE

In this paper I wish to call attention to an appliance designed by Hinselmann of Germany which enables one to inspect the cervix more thoroughly than has been possible heretofore and to detect even slight alterations which otherwise would remain undiscovered. This apparatus, which is called the colposcope by its originator, consists essentially of a pair of binoculars mounted on an adjustable upright (fig. 1).[2] These binoculars have a focal range of about 2 feet and are equipped with several sets of lenses that magnify the object from 10 to 30 times. The binoculars carry in front a small electric bulb, which projects a beam of intense light and is connected by way of a rheostat with the nearest electric socket; when the cervix is exposed in a speculum, the surface of the vaginal portion can be studied carefully with satisfactory illumination and the magnification renders even the most minute lesions visible.

With this instrument Hinselmann has examined all his patients in a routine manner and discovered an unexpectedly great frequency of leukoplakias on the cervix, namely, 1 out of every 114 patients examined. In fact, he has found perfectly normal conditions of the

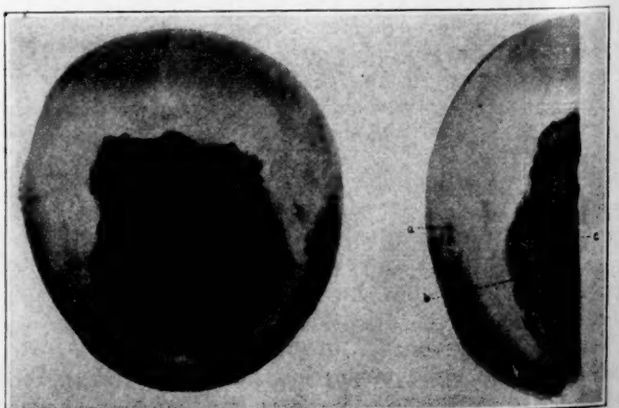

Fig. 3.—Congenital ectropium. Right, ectropium with beginning transformation zone: *a*, normal portio; *b*, transition region; *c*, ectropium.

* From the Department of Gynecology and Obstetrics, St. Louis University School of Medicine, and the Barnard Free Skin and Cancer Hospital.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

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mucous membrane covering the cervix in only 10 per cent of the cases. This represents what he calls the virginal or ideal type of cervix (fig. 2). In another 10 per cent he found a congenital extension of the epithelium of the cervical canal on the vaginal portion (fig. 3). Whereas, ordinarily, the multiple squamous epithelium of the cervix and the single cylindric epithelium of the mucosa of the cervical canal meet at the external os, there is in these cases of congenital extension a more or less annular zone of reddening around the external os, which simulates an erosion but in reality is merely caused by the color of the thin cylindric epithelium. The third type is the one most commonly observed. It occurs in about 80 per cent of all cases and comprises what is commonly called erosion. Such an erosion is either primary and is produced by an infectious process, usually within the cervical canal, or is established on the everted lips of a torn cervix after the exposed mucosa of the cervical canal has become subjected to inflammatory influences (fig. 4).

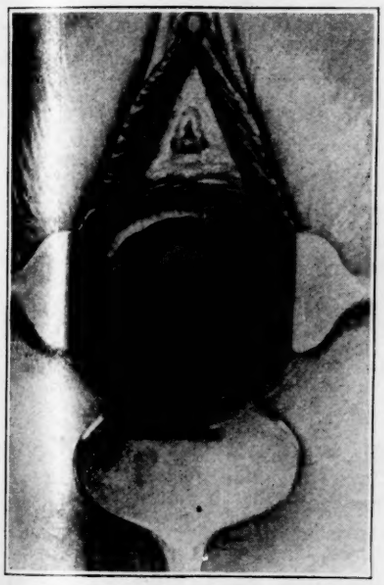

Fig. 4.—Erosion.

The spontaneous healing consists of the creeping of pavement epithelium over the surface of such an erosion (fig. 5). This mechanism can well be studied through the colposcope (fig. 6). One can see islets of pale pavement epithelium scattered over the bright red area of the erosion. Here and there appear the opened ducts of cervical glands. In other places these glandular openings have been closed. As they are unable to discharge their mucous secretion, such glands will in time distend and finally turn into retention cysts. One such nabothian follicle is seen protruding on the posterior aspect of the erosion. Newly formed capillaries extend in all directions where the pavement epithelium has covered over the cylindric epithelium.

GROSS AND MICROSCOPIC APPEARANCE OF LEUKOPLAKIA

Of particular importance is the transitional zone at the periphery of the erosion because it is here that leukoplakias are most commonly detected (fig. 7). The surface of these opaque patches appears rough and little elevated above the surrounding mucosa. They are polygonal and have a distinct outline. Frequently they are too small to be seen with the naked eye since they measure only 60 to 70 microns in diameter, though they may attain the size of 10 mm. With the colposcope all leukoplakias are clearly visible (fig. 8).

In order to appreciate the microscopic picture of leukoplakias, it is necessary to recall that normally the mucosa of the vaginal portion is composed of multiple squamous epithelium. The basal layer consists of a row of cuboidal cells with well staining nuclei; these basal cells lie at right angles to the underlying stroma. The many layers between the basal layer and the surface are made up of more or less pronounced polygonal cells, which become more flattened the closer they are to the surface. The most superficial two or three layers of cells lose their outlines and do not take the stain so well, but they rarely show any tendency toward horni-

Fig. 5.—Healing of an erosion (diagrammatic).

fication, which is readily explained by the fact that they are not subjected to the drying influence of the air. The underlying stroma rises into the mucosa in the form of low and infrequent papillae.

Compared with this normal histologic picture, the structure of the leukoplakia (fig. 9) is impressive because of its greater density and number of cells and the deeper stain taken by the lesion. The basal layer remains intact. The number of papillae is slightly increased. The border between the normal epithelium and the leukoplakia represents a sharp demarcation. The superficial epithelium is definitely hornified. This earliest stage of leukoplakia is seen in fig. 9.

In a more advanced stage (fig. 10) the epithelium grows more deeply into the underlying stroma. The

Fig. 6.—Transition zone: *a*, original mucous membrane of portio; *b*, external os; *c*, mucous membrane of canal; *d*, open and closed glands; *e*, healing of squamous epithelium of portio over cylindric epithelium of eversion; *f*, nabothian cyst.

basal cells are often irregular in size and lie no longer at right angles to the substrate, but the basal layer always remains unbroken. As a rule there is a round cell infiltration beneath the base of the leukoplakia.

In a still more advanced stage (fig. 11) of leukoplakia the atypical down growth of the epithelium into the stroma forms the connecting link with a beginning

carcinoma. The cells are no longer regular in outline. Here and there the basal layer is broken through and solid columns of cells extend into the underlying tissue and, by forming branches, show invasive qualities. In places, masses of cells seem to lie isolated in the stroma without apparent connection with the mother epithelium. The proliferating cells exhibit large numbers of mitotic figures and stain very deeply.

REPORT OF CASE

The actual transition into carcinoma could be well observed in a case of leukoplakia which was discovered by means of the colposcope in the service of Dr. F. J. Taussig at the Barnard Free Skin and Cancer Hospital:

A woman, aged 38, the mother of three children, came to the dispensary complaining of vague pains in the lower part of the pelvis and a yellowish vaginal discharge. The cervix felt slightly thickened and somewhat nodular, especially in the posterior lip. The uterus was small, retroverted and freely movable. Both adnexal regions were normal. The colposcopic examination revealed a red granular area on the anterior lip, extending a trifle to the posterior lip on the right side. Near the left upper margin of the erosion a small white, somewhat triangular area

Fig. 7.—Leukoplakia of the portio.

with the largest diameter of about 4 mm. could clearly be seen. For purposes of microscopic study the cervix was amputated, and figure 12 shows the vaginal portion with the erosion and leukoplakia at considerable magnification. The histologic observations are represented in figures 13 and 14. Within the leukoplakic area the hyperkeratosis of the superficial cells was very marked. The basal layer was hyperplastic. The underlying stroma was infiltrated with round cells and at one point was invaded by a mass of cells exhibiting hyperchromatism and mitoses which had broken through the basal layer. The histopathologic picture was that of an advanced leukoplakia and a beginning squamous cell carcinoma (grade I).

This case, then, represents an instance in which an extremely early stage of malignant degeneration was recognized by means of the colposcope, at a time when neither symptoms nor the usual clinical examination could possibly have created a suspicion of the existing pathologic condition. In so early a phase of the disease, cancer of the cervix should theoretically be eradicable with ease and with every promise of permanent cure. Von Franqué has reported six cases of leukoplakia that had been followed for a number of years. In two the cervix had been amputated, and no further disturbance developed. The other four patients were left untreated, and all developed squamous cell carcinoma at a later date. Our patient, unfortunately, eluded further observation, and it is impossible to gage the permanent benefit of the amputation of the cervix. In further cases of this kind we shall prefer hysterectomy or possibly electrocoagulation of the cervix.

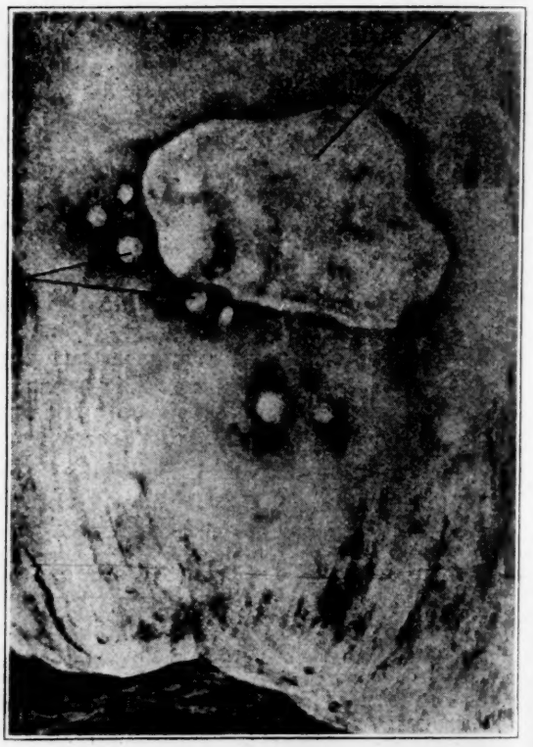

Fig. 8.—Leukoplakia of the portio.

SUMMARY

The importance of timely recognition and the removal of precancerous lesions in relation to malignant growths of the cervix uteri is generally accepted. Among these precancerous lesions, however, leukoplakia of the cervix has not yet received the widespread attention it deserves. This has been due to a large extent to the fact that leukoplakia easily escapes inspection with the naked eye. Hinselmann has designed an apparatus called the colposcope, which permits of ready detection of even the slightest alterations of the vaginal portion and in a large number of publications he has added extensively to our knowledge and appreciation of the nature and significance of leukoplakias. His contentions

Fig. 9.—Leukoplakia, grade 1.

have been fully confirmed by a personal case which is described in the foregoing and which shows conclusively that the use of the colposcope renders possible the diagnosis of the earliest stages of cancer of the cervix.

508 North Grand Boulevard.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HEALY AND EMMERT

DR. HENRY SCHMITZ, Chicago: The clearly localized cancer on examination usually presents a nodule and does not cause any symptoms, while the doubtfully localized cancer has begun to ulcerate, and causes contact bleeding, as Dr. Healy has stated, and hence in the sexually inactive patient does not produce symptoms. The fact that these stages are practically free from symptoms is responsible for this bad state of affairs and also explains the failures to make an early diagnosis. Routine inspection of patients whenever they come for examination or for a health survey appears to be the only logical solution. Chronic changes of the cervix would thus be recognized and, when found, should be immediately and adequately treated. If the statistics on the five-year good end-results in carcinoma of the cervix are perused, it is found that clinical groups 1 and 2 number about one fourth of all cases admitted to a clinic, but contribute three fourths of the good end-results. On the other hand, clinical groups 3 and 4 number about three fourths of all

Fig. 10.—Leukoplakia, grade 2.

cases and contribute only one fourth of the five-year good end-results. It would appear, if one follows the observations which have been made by various investigations, that carcinoma can develop only on the basis of a chronic cervicitis and that if one treats the chronic cervicitis one will reduce the incidence of cancer. The early stages of curable cancer of the cervix are symptoms; hence gynecologists should, as a routine, examine the cervix of their clients. Another statement made by Dr. Healy was that 95 per cent of these women are multiparas. In our material at Chicago we found that practically 20 per cent were nulliparas and 80 per cent were multiparas, and the incidence of cancer was as great in the nulliparas as in the multiparas. I should say that the trauma incident to birth forms a predisposition to a chronic cervicitis, but it is the treatment of the chronic cervicitis that reduces the incidence and secondarily the control of cancer.

DR. FLOYD E. KEENE, Philadelphia: In the discussion of cervical carcinoma, one must take three points into consideration: (1) prophylaxis; (2) palliation, and (3) cure. The importance of prophylactic treatment has properly been emphasized. Carcinoma of the cervix is essentially a disease of the traumatized organ. Therefore, it stands to reason that if one can remove the exciting cause, the incidence of carcinoma of the cervix must inevitably be greatly diminished. In evaluating the results of the treatment of carcinoma of the cervix by radium, one must divide the patients into two large groups: (1) those in whom only palliation can be anticipated and (2) those in whom a cure may be expected. In spite of extensive propaganda, early cancer of the cervix is rarely seen. In our series of almost 300 patients, in only 9 were early lesions found. It is evident, therefore, that in by far the greater proportion of cases with carcinoma, all that one could expect to accomplish is to palliate the symptoms, and if radium has done nothing, its beneficent influence has proved a boon to these sufferers, since there is nothing which compares with it in the relief of hemor-

Fig. 11.—Leukoplakia, grade 3.

rhage and foul discharge. It is important, however, in the use of radium to be careful as to the choice of the case in which it should be employed. I am opposed to the use of radium in stage 4, when there has been wide extension into the parametrium with involvement of the rectovaginal and vesicovaginal septum. Here, radium can be of no benefit so far as cure is concerned, and not infrequently its use is followed by exaggeration of suffering. Further, by its use in these advanced cases,

Fig. 12.—Leukoplakia of the cervix.

discredit is cast on a method, which, in properly selected cases, offers hope of cure or palliation. We have not operated on patients with carcinoma of the cervix in the John G. Clark Clinic for the past fifteen years, although Dr. Clark was one of the first to advocate radical operation. During our early experience, radium was employed only in the more advanced lesions, but as time went on we gradually extended its use until

finally operation was abandoned in favor of irradiation. We believe that sufficient data have accumulated to show that irradiation offers at least as good results as operation in the treatment of cervical carcinoma, with less suffering and with certainly great economic saving. Therefore, we believe that cervical carcinoma no longer belongs in the realm of surgery but has passed over into that of irradiation.

DR. BROOKE M. ANSPACH, Philadelphia: In a series of five-year cases recently reported from our service in the gynecologic ward of the Jefferson Hospital, only 5 per cent were considered to be in the operable stage. In the early stage of cancer of the cervix the prognosis with irradiation is so good that prompt diagnosis becomes a matter of outstanding importance. There is a definite proportion of cases in which even the most observing woman will be unaware that she needs attention. This fact throws a responsibility directly on the family physician and the obstetrician. Attention should be focused on the cervix after labor, and whatever damage has resulted should be corrected. All women approaching the menopause, whether they have symptoms or not, should be examined, and any obvious lesions of the cervix should be corrected. The physician who is aware of cervical disease in one of his patients should feel that it is his duty to acquaint her with the need of such treatment. In my experience the most reliable indication that suspected cervical areas are malignant has been a peculiar friability of the tissues, so that when they are touched with a small curet the tissue crumbles and comes away in fragments. When this friability does not exist, the lesion is rarely malignant, but one must depend on the microscope for a final decision. Whatever means are used for obtaining biopsy material, the area should be immediately cauterized. Manipulation should be made with gentleness and as little disturbance of the surrounding parts as possible. Inflammatory lesions of the cervix and vaginal vault in older women sometimes mimic this friability of malignant tissue, and these lesions must be carefully differentiated. So far as the early recognition of cancer of the fundus is concerned, it may truthfully be said that a diagnosis cannot be made without curettage. This procedure will often be done with a negative result, but it is so simple and so easily accomplished that it should never be delayed. Every part of the endometrial cavity must be reached, but with scrupulous care that the inner layers of the myometrium are not traumatized. Radium should be at hand for introduction in suspected cases and should be left in place until by some rapid method the curettings have been prepared and examined. The radium may then be removed when the lesion is benign, or left in place for its destructive effect when the lesion is malignant, hysterectomy to be performed in suitable cases from six to eight weeks later.

Fig. 13.—Leukoplakia with beginning squamous cell carcinoma.

DR. M. REESE COHEN, Philadelphia: Hinselmann's colposcope has been used abroad and is reliable in the diagnosis of these conditions. However, I think that some method which could be put in the hands of the general practitioner would be acceptable, since he is responsible for the early diagnosis. Schiller has laid emphasis on the application of compound solution of iodine in the form of a tampon, a simple procedure which may be used by any one and which clearly brings out the demarcation between the normal and the pathologic tissue. Compound solution of iodine will stain the normal healthy tissue; the diseased tissue remains unstained. This gives the general practitioner a simple method of showing up the diseased tissue.

DR. WILLIAM P. HEALY, New York: We use heavy doses of radium at the Memorial Hospital because we happen to have it—we have 8 Gm.—but it is entirely unnecessary for a man to have a large amount of radium. One hundred milligrams of radium is all that any person needs to own or have available if he wishes to treat cancer of the cervix. A man who is going to treat cancer of the cervix should own about 100 mg. of radium, should put his mind on the subject, study it, and become as conversant as possible with the features of the treatment, because it is a serious matter to use radium, and one must use it properly. One must always have x-rays available. One must also have the irradiation with radium done in collaboration with a competent roentgenologist who can give proper high voltage x-ray cycles. Retreatments are impossible for any recurrence at the site of the original tumor in or near the cervix. If one has properly irradiated that lesion with a competent, adequate dose in the beginning, and three or four months later finds a recurrence of the cancer, I believe, if the case is favorable for hysterectomy, that is, if it is an early or borderline case, that the patient will live more comfortably during the time she does live, if a panhysterectomy is done then. One must prove the recurrence with a biopsy. We never use the cautery on a cauliflower lesion or on any other cervical lesion unless we have first thoroughly irradiated the pelvic field and the cervix, at least with a high voltage x-ray cycle repeated twice, or with radium applied through the vagina. We think that it is unwise to tear and open up lymphatics in the endeavor to use a cautery, unless one has first rendered the cancer cells reasonably nonviable by the use of roentgen therapy plus radium.

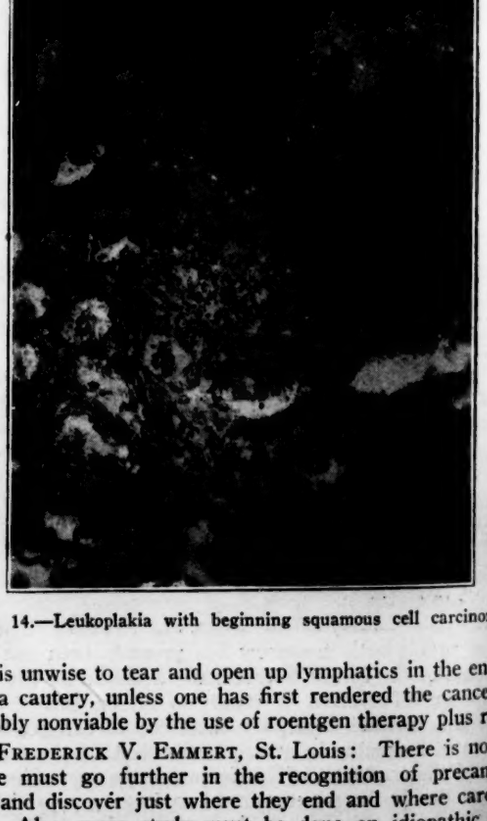

Fig. 14.—Leukoplakia with beginning squamous cell carcinoma.

DR. FREDERICK V. EMMERT, St. Louis: There is no doubt that we must go further in the recognition of precancerous lesions and discover just where they end and where carcinoma begins. Also, more study must be done on idiopathic leukoplakias to ascertain whether or not the syphilitic leukoplakias develop into cancer.

THE ROENTGEN RAYS AND RADIUM IN TOXIC GOITER AND HYPERTHYROIDISM

EVALUATION AND TREATMENT *

J. THOMPSON STEVENS, M.D.

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MONTCLAIR, N. J.

The published reports of many authorities have served to remove irradiation therapy from the field of experimentation in the management of certain diseases that are prone to occur in the thyroid gland. Furthermore, these reports have placed on a firm basis the methods of treatment about to be described. In fact, I feel it will be agreed that today for the symptom-complex known as toxic goiter, hyperthyroidism, exophthalmic goiter, Graves's disease, Basedow's disease and so on there is probably no treatment followed by better results than that of correctly applied roentgen or radium rays. Holmes and Means [1] state that about two thirds of patients with exophthalmic goiter so treated show either recovery or improvement with the treatment. The remaining third neither improve nor grow worse. Barclay,[2] in a series of 300 treated cases, reports as cured 63.3 per cent and as improved 24.6 per cent, giving a total of 87.9 per cent relieved. Jenkinson [3] says: "About 80 per cent of exophthalmic goiters will respond to x-ray therapy and in the failures, which number about 20 per cent, it is our experience that very little benefit is received, regardless of what type of therapy is used. If radiation fails to produce a cure—speaking now of the exophthalmic type—surgery in most cases is also a failure." Loucks,[4] with the experience of having treated 480 cases says: "With us, we conclude that we have what you might call a complete control of all toxic symptoms in over 98 per cent of cases." Holzknecht [5] in 1928 stated that from 80 to 90 per cent of his cases were either cured or markedly improved.

Groover, Christie, Merritt, Coe and McPeak,[6] in a paper of special merit, a careful study of which is advised, reported a total of 447 goiter cases, in 305 of which all the requisites for determining the efficacy of roentgen therapy were reasonably well met. They reported 271 cases of the disease, or 88.85 per cent, cured; 26, or 8.52 per cent, improved and 8, or 2.63 per cent, unimproved. The figures for the cured and improved cases total 97.37 per cent.

Pfahler and Vastine [7] have published an exhaustive report on 532 cases, of which 400 were selected for treatment. Of these, 327 cases were of the toxic type. In this series, 88 per cent were either cured or markedly improved.

AUTHOR'S RESULTS

This report is based on the data obtained from a total of 325 patients presenting various types of goiter. Of these there were twenty-seven patients suffering with nontoxic types; that is, twenty-seven individuals were advised to seek other methods of treatment, chiefly surgical, because the very nature of their ailment made it most unlikely that they could hope for anything from the best of radiation therapy. There were twelve patients who were earnestly advised to submit to radiation therapy for thyroid intoxication but who did not follow directions. In sixteen cases of thyroid intoxication, irradiation was given up before enough treatment had been given to accomplish anything.

In 270 cases of toxic goiter and hyperthyroidism, all the details of treatment were satisfactorily followed. The youngest patient was a girl, aged 12 years, and the oldest a woman, aged 74. Of these, 243 cases, or 90 per cent, were cured by radiation therapy. This leaves twenty-seven patients not cured by the treatment. Of these, twelve, or 4.44 per cent, were definitely improved; twelve, or 4.44 per cent, were not improved, and three, or 1.11 per cent, died. No case classed as cured or improved was so called unless at least one year had passed since the date of the last treatment. By a cure is meant a return of the pulse to normal; lost weight was regained, patients frequently being a few pounds heavier following treatment than their best weight before the onset of the disease; tremor disappeared; the thyroid tumor disappeared, and the basal metabolic rate returned to normal.

CLINICAL PATHOLOGY

For years the terms toxic goiter and hyperthyroidism have been used interchangeably. Toxic goiter is due to an increase in numbers of the normally secreting cells (hyperplasia) of the thyroid gland. In cases characterized by hyperplasia there is a tumor at the site of the thyroid gland. The tumor may be visible on direct inspection, or it may grow downward into the mediastinum, where it can be demonstrated by means of a roentgen study of the mediastinum. Therefore in my clinic a tumor or enlargement of the thyroid gland with thyroid intoxication is called toxic goiter. Hyperthyroidism is the disease caused by thyroid cells which are normal in numbers but which are hyperactive. In such a case no tumor is visible or demonstrable. In some cases there is only a hard nodule in one lobe of the thyroid or the isthmus, and in the presence of thyroid intoxication this is called toxic adenoma.

FOCI OF INFECTION

Any focus of infection found should, of course, be removed by the indicated method if possible. These infections are found at the roots of dead teeth and frequently in the tonsils and colon; however, a chronic infection of the appendix, gallbladder or genito-urinary tract must not escape attention if present. In private conversation a prominent gynecologist once stated that the results obtained in my cases might be due to the fact that severe chronic infection had been removed and that recovery might have followed without any radiation treatment. This is doubtful, because the majority of patients treated for toxic goiter have not shown evidence of any infection. Then, too, a small series of patients had only chronic infections eradicated, without any definite improvement in thyroid symptoms being

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* From the J. Thompson Stevens Clinic for Radiation Therapy and Electrothermic Surgery.

* Read before the Section on Radiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

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6. Groover, T. A.; Christie, A. C.; Merritt, E. A.; Coe, F. O., and McPeak, E. M.: Roentgen Irradiation in the Treatment of Hyperthyroidism, J. A. M. A. **92**: 1730 (May 25) 1929.
7. Pfahler, G. E., and Vastine, J. H.: Results of Roentgen Therapy in Goiter, Based upon Observations in 400 Cases, Am. J. Roentgenol. **24**: 395 (Oct.) 1930.

noted. Improvement began in each case soon after active treatment was instituted. Then there have been fastidious patients who would refuse to have an abscessed front tooth extracted, for instance, and in some of these no great difficulty was experienced in obtaining the result. On the other hand, patients have failed to improve under treatment satisfactorily until some focus of infection was found and eradicated. From this discussion it is difficult to state exactly the part played by chronic infection in cases of toxic goiter and hyperthyroidism.

INDICATIONS FOR RADIATION THERAPY

Those of us who have had considerable experience in the management of hyperthyroidism and toxic goiter appreciate the fact that the diagnosis of this malady indicates at least a trial with radiation therapy, with one or both of the physical agents roentgen rays and radium. If the operator is competent, only rarely will anything else be necessary other than the indicated medical treatment. Associated medical measures, particularly in severe cases of toxicity, are very important, no matter what form of specific treatment is prescribed. Radiation therapy is the only method of radical treatment that can be safely carried out in cases showing great intoxication with a high metabolic rate or in those with a low metabolic rate that is rapidly rising.

CONTRAINDICATIONS TO RADIATION THERAPY

A large tumor that is showing distinct signs of pressure is an indication for surgical removal. This will promptly relieve the pressure symptoms and, if too little of the gland is removed to produce normality from the symptomatic and basal metabolic rate standpoints, radiation therapy can be expected to perfect conditions if used postoperatively. On the other hand, in such a case, if there is evidence of great toxicity, radiation therapy if used preoperatively will reduce the operative mortality.

Some one has stated that radiation therapy is followed by dense adhesions which increase the difficulty of surgical removal, should this prove necessary. In reply to a letter touching on this question, Dr. Crile says: "Regarding your inquiry concerning the irradiation of thyroid cases, I have frequently operated on patients who have had long continued treatment and have noted that these patients, if the treatment has been long enough, may leave adhesions which are somewhat difficult to dissect. The ordinary case, however, which has had x-ray treatment shows very little change as compared with other glands. As you say, it might also be due to thyroiditis. A great many of these cases also have hyperplastic glands, and these cases, even without any treatment, have been very difficult to dissect out." Dr. Rogers of New York City received a like questionnaire and replied "I often have these cases x-rayed before and after operation and have never found the operative difficulties increased." To me the statements of these two authorities are so clear and to the point regarding this question that further discussion is unnecessary.

Another objection to the irradiation of these patients is the danger of producing the opposite condition, hypothyroidism. Of course, we know that there is little or no danger of such an accident. No normal thyroid tissue can be destroyed by any such dosage as is employed in the treatment of this malady. If these patients are seen frequently and a careful examination is made before each treatment, together with repeated metabolic estimations, the danger of producing hypothyroidism can be forgotten.

Therefore it appears that those patients who present severe pressure symptoms with large tumors, those who need quick relief from pressure, are the ones who should have surgical intervention. Later, if toxicity still exists, radiation therapy can be added to perfect conditions. Also, those who fail to get relief after properly applied radiation therapy should be referred for surgical treatment.

TECHNIC FOR ROENTGEN IRRADIATION

The vast majority of cases of toxic goiter and hyperthyroidism are probably best treated with the roentgen rays. These are applied at two separate sittings, with one day of rest between. Generally the first day's treatment consists of irradiation through one port of entry over the posterior surface of the neck and upper mediastinum. In my clinic this particular treatment is made easy for the patient by the use of a special treatment couch with the tube underneath the patient. The factors are 4 milliamperes, 180,000 volts, 0.5 mm. of zinc plus 3 mm. of aluminum as a filter, 50 cm. focus to skin distance and 200 r units dosage. The port of entry is 10 by 20 cm.

On the second day following this treatment, both the right and the left lobes of the thyroid are treated from the anterior surface of the neck at one sitting. For this purpose the usual overtable type of tube stand is used. From each port the rays are directed downward and inward, so that, after having passed through the thyroid, they thoroughly irradiate the upper mediastinum from the front. The factors for these treatments are 4 ma. 150,000 volts, 0.25 mm. of zinc plus 3 mm. of aluminum filter, 32 cm. focal skin distance and 200 r units dosage.

On completion of the second day's treatments, one complete series of treatments has been administered. The average case demands usually seven or eight such series of treatments, although occasionally one is forced to give additional treatment. The degree of toxicity in the individual case cannot be used to predict the amount of treatment necessary. For instance, one patient, with a larger tumor, a pulse of more than 160 per minute, and a basal metabolic rate above plus 80 per cent, after only four series of treatments had a pulse of 74, a basal metabolic rate of zero and no tumor.

TECHNIC FOR RADIUM TREATMENT

Radium is used in those patients who are unable to leave their beds because of the severe toxicity. The method consists in using 10 mg. tubes or needles in sufficient numbers to cover the tumor. They are applied in the form of a pack filtered by the needle wall, plus 1 mm. of brass at a distance of 2 cm. The distance between tubes is 1 cm. The time duration is up to sixteen hours, based on the interpretation of the individual indications. As soon as improvement warrants it, the patient is brought to the clinic and treated with roentgen rays, because such treatment can be executed more quickly.

Toxic adenomas are treated best, it is felt, with radium element needles inserted directly into the tumor. For this purpose, 5 mg. needles are used, each being placed 2 cm. from the other; that is, each 2 cm. of tumor tissue contains one radium element needle. In my experience, one such treatment is sufficient to remove the tumor, to remove all toxic symptoms and to produce a normal basal metabolic rate. Treatment by

roentgen irradiation in toxic adenomas, on the other hand, has been a long tedious process and, except in one instance, has failed to produce the desired result.

CLINICAL COURSE FOLLOWING IRRADIATION

1. Occasionally, patients with toxic goiter and hyperthyroidism suffer with increased toxicity for a few days following the initial treatments. Fortunately this is soon followed by relief, and gradual improvement takes place.

2. Nausea, vomiting and diarrhea, when present, are among the first symptoms to improve or disappear.

3. Early during the course of active treatment the strength begins to improve and pruritus disappears. Soon the weight increases, while palpitation, tachycardia, tremor, dyspnea and the tumor decrease and finally disappear. At this time the basal metabolic rate will generally be found to be within normal limits.

4. The eye symptoms are among the last to disappear, and in some cases the exophthalmos never completely disappears. This is also true in cases treated surgically.

5. In patients who have had severe thyroid intoxication for months or years, myocarditis frequently develops. In these cases the pulse rate is lowered but may never return to a perfect normal, no matter what the method of treatment, whether radiologic or surgical.

6. If toxic goiter is superimposed on simple goiter, cystic goiter and other forms, the original tumor remains after treatment, and the enlargement of the gland appearing at the time of the development of toxicity disappears. In hyperthyroidism, i. e., thyroid intoxication without enlargement of the thyroid gland, superimposed on simple goiter, cystic goiter and other forms, treatment is not followed by any reduction in the size of the primary tumor.

FOLLOW-UP SERVICE

As soon as the pulse rate returns to normal and the weight is restored, together with the disappearance of the tremor and the tumor, that is, as soon as the classic symptoms and physical manifestations of the disease have disappeared, the basal metabolic rate will usually be within normal limits. Then what is known as the follow-up period is instituted. This consists in examining the patient every two months clinically for at least one year following the date of the last treatment. In alternate months during this follow-up period, basal metabolic rate estimations are made. Thus it will be seen that a careful check is kept on treated cases for a reasonable length of time following the date of the last treatment, each and every case being examined at least six times at intervals of two months and not less than six post-treatment basal metabolic rate estimations being made during the same follow-up period. Except under some such plan as just outlined, it is, of course, impossible to judge the real value of any method of treatment for any malady.

SUMMARY

1. The terminology, together with the results obtained by radiotherapeutic authorities, is reviewed briefly.

2. Correctly applied radiation therapy is second to no other method of treatment, and may be expected to cure from 85 to 90 per cent of the cases.

3. The part played by the foci of infection is discussed.

4. The indications and contraindications are reviewed at some length.

5. The technic for both radium and roentgen treatments is stated, and these methods of treatment are outlined.

6. The clinical course following irradiation is stated.

7. A plan for efficient follow-up service is outlined.

55 Park Street.

ABSTRACT OF DISCUSSION

DR. J. H. VASTINE, Philadelphia: In 1929, Dr. Pfahler and I analyzed about 400 cases of hyperthyroidism in which roentgen treatment was given, with economic restitution in 88 per cent. In addition to this, we analyzed 3,300 cases from the literature and found that the results in these cases closely approximated ours. This analysis did not include 5,000 cases reviewed from the literature by Soiland and about 2,800 cases reviewed from the literature by Krause. These results were obtained with a minimum of inconvenience and suffering to the patients and they were obtained without scar and with very few recurrences. After a patient had been considered cured by us, we found recurrences in less than 1 per cent. Dr. Stevens's paper adds to the store of information which is accruing on the value of roentgen therapy of hyperthyroidism, enabling roentgen therapy to become established as a treatment of choice in selected cases; in fact, in most cases of hyperthyroidism.

DR. J. THOMPSON STEVENS, Montclair, N. J.: There are some recurrences following this treatment, but there are also recurrences from the surgical treatment of the disease. I believe that the recurrences are not more frequent after roentgen treatment than they are after surgical treatment. I have noticed that the patients who have had recurrences haven't refused further treatment. Not one has refused. In those patients who have been retreated, we have obtained the normal, and the result has been permanent.

SPORADIC SEPTIC SORE THROAT *

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AND
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Septic sore throat in epidemic form has been described as a disease due to hemolytic streptococci spread by milk. A study [1] of an epidemic in 1911 led to the recognition of an encapsulated streptococcus forming larger colonies than ordinary hemolytic streptococcus and described as Streptococcus epidemicus. In investigations of milk borne epidemics this organism has been identified as the cause of the mastitis in the cow, which was the source of the streptococci in the milk that was responsible. Of great interest has been the uniform epidemiology of the epidemics properly studied, with constant finding of streptococci corresponding to Streptococcus epidemicus. White,[2] in a review of subsequent epidemics, emphasizes the relationship of this organism to epidemic sore throat. The epidemic [3] at Baraboo, Wis., was traced to milk from a cow with mastitis. Strains of hemolytic streptococci from the udder of the cow and from throats or ears of patients were typical Streptococcus epidemicus. Our

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* From the Department of Pathology and Bacteriology, University of Illinois College of Medicine.

* Read before the Section on Pathology and Physiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

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2. White, Benjamin: Epidemic Septic Sore Throat; Historical Review, New England J. Med. **200**: 797 (April 18) 1929.

3. Hadley, F. B.; Frost, W. D.; Gumm, M., and Welch, W. E.: Bovine Mastitis Caused by Streptococcus Epidemicus, J. Am. Vet. M. A. **77**: 328-337 (Sept.) 1930.

investigations of these strains led to the development of a culture medium which enabled us [4] to differentiate more readily Streptococcus epidemicus from other hemolytic streptococci. On this medium, Streptococcus epidemicus forms large flat wrinkled colonies, which in moist india ink preparations show encapsulated cocci. With the aid of this medium we [5] extended our bacteriologic studies of throat infections and found that this organism causes the sporadic form of sore throat as well as the striking milk borne epidemic type.

The epidemics reported in various sections, such as Wisconsin, New York, Massachusetts, Illinois and Oregon,[2] had no apparent relationship to one another. The intervals of reports of epidemics varied from several months to a year or more. It would seem most probable that septic sore throat occurs in sporadic form and, through the milker as a carrier or with active throat infection, a cow acquires mastitis which may lead to an explosive epidemic from the milk. The epidemic type is the exceptional or unique form of the disease. The disease in its epidemiology should resemble the other infectious diseases, such as scarlet fever and diphtheria.

Our purpose is to point out the etiologic importance and frequency of Streptococcus epidemicus in sporadic sore throat and to discuss the sequelae and the human carriers of Streptococcus epidemicus that may result from the sporadic form of the infection.

INCIDENCE OF SORE THROAT DUE TO STREPTOCOCCUS EPIDEMICUS

Ordinary sore throat or tonsillitis is endemic and is spread most probably by contact or droplet infection. The clinical observation is that of an exudate on the tonsils, associated with a variable degree of general symptoms and fever. In its manifestation the ordinary tonsillitis resembles the epidemic type, excepting perhaps for a large number of severe cases in the latter. However, severe toxic manifestations may also be observed independent of epidemics but only in a few instances. In our cases, cultures were made from patients with sore throat in whom the manifestations varied from soreness in the throat with slight fever to that of the severe type with a temperature of 107 F. and marked general symptoms. The hemolytic streptococcus appeared to be the outstanding cause of throat infections. Of 272 patients the streptococcus was recovered in large numbers and often in pure culture in 50 per cent. Hemolytic streptococci were obtained in pure state in a certain proportion of tonsillectomized persons who presented a clinical picture of pharyngitis, "cold" or "upper respiratory infection."

Of seventy-six strains of hemolytic streptococci isolated from acute throat infections, eighteen on the ascites blood agar yielded colonies like the Streptococcus epidemicus of epidemic sore throat. With Dr. Philip Rosenblum we determined the bacteriology in a series of children from 18 months to 12 years of age, acutely ill with sore throat. Of 102 cases, 59 yielded hemolytic streptococci, 9 of which were of the epidemicus type. In our first study [5] we obtained three in thirty cases between December, 1929, and April, 1930. We then noted the infrequent occurrence of streptococcus sore throat in the summer months of 1930. A few cases appeared in the fall, and a higher incidence occurred in the winter; but the greatest frequency was in the spring of 1931. This seasonal variation was noted in sore throat due either to ordinary hemolytic streptococci or to Streptococcus epidemicus and corresponded to the seasonal outbreaks of epidemic type in winter and in spring and to the seasonal curve of scarlet fever.

The sore throat due to Streptococcus epidemicus appeared in persons from 18 months to 45 years of age. Practically all the cases occurred independently of one another with the exception of one in which contact appeared to be a factor. The development of the sore throat in a single member of a family or of an institution excluded milk or other dairy products as the source of infection. Milk as a source was not probable, for the patients were consumers of the pasteurized product of the large companies.

CLINICAL MANIFESTATIONS

The sore throat affected persons regardless of the presence or absence of faucial tonsils, which, however, did influence the clinical picture. The infection was observed in patients with tonsils of varying size, in tonsillectomized persons and in a few with remnants of recurrent or residual lymphoid tissue in the throat.

In patients with tonsils the infection developed in a more severe form. In this group, however, mild symptoms were also noted. The severe forms were observed in late adolescense and in young adults. The onset was acute, often with a chill or chilliness and high fever (103 to 107 F.), rapid pulse with accompanying marked malaise, and muscle soreness. Early the throat became reddened and the tonsils large and edematous, although the complaint of sore throat at this time was not very marked. At this stage a pure culture of Streptococcus epidemicus may be obtained. In twelve hours or more a grayish white exudate appeared on the tonsillar surfaces, and the engorgement assumed a deeper red hue and swallowing now was very painful. The exudate, at first in spots, became confluent but as a rule could be readily removed. The glands at the angle of the inferior maxilla became distinctly enlarged and tender. The fever remained high and the pulse was rapid for from three to four days; then it gradually returned to normal within six to twelve days after onset. Weakness and prostration often persisted after the fever dropped. The blood count varied from 12,000 to 28,000, with an increase in the polymorphonuclear leukocytes. The urine often contained albumin and casts.

In milder cases the fever was slight or up to 102 F. The tonsillar reaction was not as marked in the severe form, although in several instances the tonsils were intensely reddened and the exudate profuse, while the general symptoms were mild. Cervical adenitis developed in many, regardless of the severity of other symptoms. In most of the mild and severe forms, Streptococcus epidemicus disappeared from the surface of the tonsils after the fifth day; in some patients the streptococci persisted in large numbers and became the source of complications.

The clinical picture in the tonsillectomized person was of great interest, resembling to some extent influenza. If cultures were not taken, the condition would not be recognized as septic sore throat. In an abrupt onset with chilliness, the temperature was often high (104 F.), accompanied by muscular soreness and marked prostration. The pulse, however, was rapid as a rule and not slow in proportion to the fever, as in influenza. The pharynx was reddened, and lymphoid

4. Pilot, Isadore; Hallman, Blake; and Davis, D. J.: A Culture Medium for the Isolation of Streptococcus Epidemicus of Septic Sore Throat, J. A. M. A. **95**: 264 (July 26) 1930.

5. Pilot, Isadore; and Davis, D. J.: Sporadic Septic Sore Throat Due to Streptococcus Epidemicus, J. Infect. Dis. **47**: 507-510 (Dec.) 1930.

follicles that were present were prominent and occasionally covered with grayish white exudate. Soreness in the throat was not marked and was often only a feeling of rawness. Adenitis was usually not as frequent as in the tonsillar cases. There was a marked tendency toward the development of a cough and of chest pains, but physical signs of pulmonary involvement were lacking. The course, as in the tonsillar forms, extended from five to ten days. In several instances the infection developed in the ambulant person, with little or no fever, general malaise and redness in the pharynx, from which the cultures yielded large numbers of Streptococcus epidemicus. In persons with remnants of tonsils, the redness was general and the exudate formed on the lymphoid tissue in focal areas. The clinical symptoms in one such case were quite severe, with fever 105 F., rapid pulse, sore throat and marked prostration.

COMPLICATIONS AND SEQUELAE

The course of septic sore throat in most instances was that of gradual subsidence of fever and sore throat, without complications. The complications or sequelae, as in scarlet fever, were noted at two periods: immediately or a few days after the onset and later during the second, third or even fourth week, when a recrudescence of sore throat, fever and complications occurred, as listed in the accompanying table.

Stages in Septic Sore Throat

Primary Acute	Secondary Acute (Allergic Phase)	Chronic or Carrier Stage
Fever	Recrudescent fever and	Chronic tonsillitis
Sore throat	sore thoat	Cervical adenitis
Complications	Otitis, mastoiditis	Arthralgia or arthritis
Otitis	Meningitis	
Mastoiditis	Peritonsillar abscess	
Meningitis	Cervical adenitis	
Cervical adenitis	Polyarthritis	
Peritonsillar abscess	Endocarditis	
Peritonitis	Glomerulonephritis	
	Erythema nodosum	

The immediate complications most noteworthy were acute otitis media and mastoiditis. A feature that should be commented on was the lack of relationship between the severity of the initial symptoms and the complications that developed in mild cases and even in ambulatory patients. When a "cold" or slight sore throat became complicated by otitis media, the symptoms were sometimes stormy, with rapid extension to the mastoid and the meninges. The otitis media in its clinical manifestations [6] did not vary from otitis due to other hemolytic streptococci, but the greater tendency to mastoiditis and meningitis should be emphasized. Among seventeen strains of hemolytic streptococci isolated from mastoiditis from January to April, 1931, nine were Streptococcus epidemicus. In five strains of hemolytic streptococci from meningitis complicating otitis, all were Streptococcus epidemicus. It is quite evident that Streptococcus epidemicus is characterized by greater aggressiveness than is observed in ordinary hemolytic streptococci. The same property is emphasized by the identification of Streptococcus epidemicus from four fatal cases of peritonitis, in three of which the throat cultures yielded the same organism. In one the stool contained the organisms and, according to Saphir and Weil,[7] in these cases the so-called primary peritonitis was due to the streptococci migrating through the bowel affected with a mild enteritis, rather than to a hematogenous infection. Cervical adenitis was common and usually subsided. Peritonsillar abscess and suppurative adenitis were infrequent. Pains in muscles were not uncommon, but true arthritic pains were observed in patients who usually had previous attacks of rheumatic arthritis. In epidemic sore throat, overwhelming infection with rapid fatal septicemia has been reported, but it occurs very rarely in sporadic sore throat. We have not observed such cases, but, if such a severe type developed in the sporadic form, Streptococcus epidemicus would probably be the causative organism.

In septic sore throat, as in scarlet fever, complications or sequelae may arise during convalescence, from ten to thirty days or more from the date of the acute onset. In both diseases this interval has been ascribed to a period of sensitization to the streptococcus. In arthritis, endocarditis and glomerulonephritis, the hypersensitiveness may be a local phenomenon in the particular organ. From our bacteriologic studies we have found that, when these complications developed, the same organisms present at the onset could be recovered again from the throat. If hypersensitiveness is a factor, it is apparently an allergy to the live organisms in the throat or to the products liberated by these streptococci.

A recrudescence of fever and sore throat developed in a few. The fever was usually not as high as at the onset and was of shorter duration. The throat became reddened and the tonsils enlarged and edematous, but the formation of marked membrane as in the primary inflammation did not occur. A thin film of exudate sometimes was seen. Cervical adenitis was often associated and in a few became suppurative. Peritonsillar abscess, acute otitis media and mastoiditis were also evident at this period. Of great interest among the systemic complications were arthralgia and polyarthritis with fever, assuming a clinical picture like that of acute rheumatic polyarthritis. The joints commonly involved were those of the hand, wrist, ankle, knee and shoulder. Pain was the greatest complaint. Gross swelling, redness and tenderness were mild or severe but more often absent. In two instances, Streptococcus epidemicus was isolated early at the onset by ordinary methods from the blood stream, and these patients at the present time are convalescing from the polyarthritis. The more severe forms of arthritis were observed in patients with tonsils from which cultures yielded the same organism. With the improvement of the arthritic symptoms the culture of the throat became negative for Streptococcus epidemicus. This association of the recovery from arthritis and the disappearance of Streptococcus epidemicus from the throat was also strikingly demonstrated in patients devoid of tonsils from whom at the height of the fever and arthritis the streptococci were isolated from the throat in almost pure culture.

In some of the patients with arthritis a systolic blow was heard at the apex but the existence of an endocarditis was not certain. In the two patients with early positive blood cultures, a systolic murmur developed, accompanied by tachycardia during convalescence. In one patient, first seen when the endocarditis was apparently subacute, the onset dated three months previously and blood cultures were persistently positive for Streptococcus epidemicus. The fever seldom exceeded 101 F., and over a course of six months the patient became markedly anemic. The tonsils yielded the same streptococcus. The blood serum developed a high titer of agglutinins for the homologous strepto-

6. Pilot, Isadore; Lampert, Max; and Davis, D. J.: Otitis Media and Mastoiditis Due to Streptococcus Epidemicus, J. Infect. Dis. 48: 498-501 (May) 1931.
7. Saphir and Weil: Personal communication to the authors.

coccus. At autopsy a thrombo-ulcerative endocarditis was found on the aortic valves.

In two patients, acute glomerulonephritis was the outstanding sequela. One of these, a young physician, was observed early with septic sore throat from which Streptococcus epidemicus was isolated in swab cultures. He had no tonsils, and the throat was markedly reddened. He apparently recovered completely from the acute angina. Three weeks later he complained of backache, and the urine on examination revealed albumin and red cells. His throat was again red and yielded a pure culture of Streptococcus epidemicus. Blood and urine cultures, however, did not contain the streptococcus. The other case developed two weeks after an acute onset in a child of 5 who gave positive cultures from the enlarged red tonsils. Otitis and cervical adenitis were also present. Both patients recovered in about four weeks.

A most interesting manifestation was the appearance of nodular lesions on the anterior surface of the legs. In their behavior they resembled erythema nodosum. The condition was observed in two young women, in one eleven days after the acute onset and in the other about four weeks later. In their throats Streptococcus epidemicus was still demonstrable. The throat of the first patient was devoid of tonsils, and the clinical onset of her illness was like that of influenza. In the second patient the skin lesions were associated with arthritic pains, which were not relieved until tonsillectomy was performed.

During the course of our studies of various purulent conditions due to Streptococcus epidemicus, we [8] recovered the organisms from three patients with empyema. The lesion had been apparently of several weeks' standing and the history of a typical pneumonia was lacking. A "cold" or bronchitis seemed to have been the initial infection two or more months before. In two of the patients, Streptococcus epidemicus was isolated from the throat and sputum. The exact source and mechanism of pulmonary complications were not clear, but it is probable that, as has been reported in epidemic sore throat, pleurisy may be a complication of the sporadic infection and may assume a purulent character.

CHRONIC STAGE (CARRIER STATE)

In a certain proportion of the patients, following either the primary acute or secondary acute stages, the tonsils remained enlarged, moderately red, and, on examination in some, purulent exudate was expressed from the crypts. The cultures often revealed moderate numbers of Streptococcus epidemicus and these individuals were now to be considered carriers. The organism in a few of the tonsillectomized patients persisted for several weeks after the acute illness, sufficiently long to be the source of complications in the late secondary acute stage. On recovery, however, the tonsillectomized person did not become a carrier in the cases that we have thus far followed.

The carrier state is exceedingly important from the point of view of prevention of epidemic sore throat that may be traced from carriers among milkers or dairy workers. In routine cultures our studies [9] have shown four carriers among 500 persons. A further investigation revealed these organisms in a larger proportion (13 per cent) in the extirpated tonsils from persons most of whom had had previous sore throats. Several notable features characterized the chronic form of tonsillitis associated with Streptococcus epidemicus. Soreness often was absent; cervical adenitis was common; exacerbations of infection with increased redness of the throat and mild fever occasionally occurred. In a considerable number of patients, pains in joints and actual arthritis existed. The tonsils in these patients were obviously the responsible focus of infection. This assumption was further supported by the effect of the removal of their tonsils, which led to complete relief of the arthritic symptoms in most of the patients. The excision of the tonsils appeared to be the most effective way of terminating the carrier state. Within two weeks Streptococcus epidemicus disappeared, and the improvement in the joint symptoms rapidly followed.[10] In the histologic study of tonsils harboring these bacteria a chronic inflammation was always demonstrable. Plus cells and bacteria frequently could be seen in the crypts. The changes in the tonsils of patients with arthritis did not differ markedly from the tonsils examined from patients without arthritis. It would appear that, although a focus of infection as in the tonsil was necessary, the development of the arthralgia or arthritis was due to hypersensitiveness of the tissues to the streptococcus. The tonsils could be referred to not only as the infectious focus but also as the source of sensitizing streptococci. The skin reaction with dilutions of Streptococcus epidemicus toxin from epidemic sore throat did not give constant reactions in arthritic patients or in carriers. However, these patients often gave marked reactions to intradermal injections of vaccines. In six patients, blood cultures made during the febrile stage with the use of the Clawson [11] technic did not yield Streptococcus epidemicus during thirty days' incubation. Such observations speak for either minute numbers of streptococci or for toxins localizing in the joints.

DIAGNOSIS

It is difficult to determine, without bacteriologic methods, sporadic tonsillitis due to Streptococcus epidemicus. Severe edema and redness, with very high fever, and early adenitis are usually due to Streptococcus epidemicus, although recently in one patient we observed such symptoms due to the pneumococcus. We shall not discuss the differentiation from diphtheria and Vincent's angina. Hemolytic streptococcus was found the most common cause of sore throat; Staphylococcus aureus was obtained in pure culture in three and the pneumococcus in two patients. In patients in whom there is greater tendency to complications, especially meningitis and the so-called primary peritonitis, the infection may be due to Streptococcus epidemicus or to the pneumococcus, illustrating a striking similarity in the behavior of these encapsulated cocci.

PROPHYLAXIS

Although the sporadic form appears to be followed by infrequent contact cases, it would be wise to isolate the patient. Particularly important are the measures with patients who may be connected with the dairy industry. Milkers or other workers on the farm, as active cases or as carriers, may be especially dangerous in handling cows and causing a mastitis. Such carriers should be sent away and subjected to a tonsillectomy if the organisms persist in the throat. In the general popula-

8. Pilot, Isadore; and Davis, D. J.: Cellulitis and Abscess Due to Streptococcus Epidemicus, J. Infect. Dis. **48**: 505; 509 (May) 1931.

9. Pilot, Isadore; Hallman, B., and Davis, D. J.: Human Carriers of Streptococcus Epidemicus, J. Infect. Dis. **47**: 503-508 (Dec.) 1930.

10. Pilot, Isadore; and Davis, D. J.: Tonsillectomy in Carriers of Streptococcus Epidemicus, J. Infect. Dis. **48**: 501-505 (May) 1931.

11. Clawson, B. J.: Studies on the Etiology of Rheumatic Fever, J. Infect. Dis. **36**: 444 (May) 1925.

tion the carriers as a source of danger has not been determined. The carriers whom we had observed had had repeated sore throats and often arthritic pains, which were best relieved by removal of the tonsils. It is not impossible that sporadic acutely infected patients or carriers may contaminate food, particularly dairy products, and lead to small epidemics of septic sore throat. Although this mode of infection has not been reported or proved, the danger should not be disregarded. For the present, such persons should at least be prevented from handling foods, in the same manner as are diphtheria and typhoid carriers.

TREATMENT

The sore throat due to Streptococcus epidemicus requires no different care than ordinary Streptococcus tonsillitis. Because of the tendency to complications, the patient should be closely watched and not permitted to become active before the throat is well healed. The production of antiserum with antitoxic properties by injections of toxins of Streptococcus epidemicus is possible for therapeutic purposes, as in scarlet fever.[12] The serum may be an important therapeutic measure in severe septic cases and in those presenting mastoiditis, meningitis or peritonitis.

BIOLOGIC PROPERTIES OF STREPTOCOCCUS EPIDEMICUS

Hemolytic streptococci from recent milk borne epidemics at Baraboo, Wis., and Kingston, N. Y., on ascites blood agar formed the characteristic large flat wrinkled colonies and capsules in india ink preparations and capsular stains. Strain 40, isolated by one of us in 1911 in the Chicago epidemic, and the strain 76 and 29 from the epidemic at Lee, Mass. (1928), had lost the characteristics on artificial mediums, but after several passages through mice the colonies assumed the typical appearance of Streptococcus epidemicus. It was noted in the passage experiments, particularly with the Baraboo streptococcus, that the colonies from heart blood became very large and less hemolytic. The streptococci from sporadic sore throat in their cultural appearance resembled those from epidemic sources. Carbohydrate fermentation tests, agglutination and absorption tests have not aided as yet in determining the specificity of these streptococci. The chocolate medium of Tunnicliff[13] is of some assistance in the differentiation from scarlet fever streptococci. Studies of the toxin of the Streptococcus epidemicus of epidemic sore throat (Baraboo C and A) indicate a specific difference from the toxin of scarlet fever streptococci in parallel skin tests, neutralization and immunization experiments.[14] This toxin injected into horses and rabbits yields antiserum with neutralizing properties specific for the homologous streptococci. From more recent studies now in progress it also appears that this toxin differs from the toxin from an erysipelas streptococcus. Streptococcus epidemicus from sporadic sore throat produces toxins in filtrates that give comparable reaction in dilutions of 1:250, which also are distinct from scarlet fever toxin. Whether or not all the sore throat toxins are identical remains to be determined.

The status of Streptococcus epidemicus in the classification of hemolytic streptococci remains unsettled. It has been suggested that Streptococcus epidemicus may be a smooth (S) form resulting from bacterial dissociation. We have succeeded, however, in dissociating two strains, one from epidemic sore throat, another from sporadic sore throat (G). On chocolate agar, both formed small smooth biconvex colonies and larger dry rough colonies with irregular margins. Inoculated back into unheated ascites blood agar, both the S and the R colonies formed the typical large epidemicus colonies. Another explanation may be that Streptococcus epidemicus is the result of passage through animal or man. In recent experiments, sixteen of thirty strains of ordinary hemolytic streptococci on one passage through mice in heart blood cultures revealed larger, more moist colonies than the original, a few not unlike Streptococcus epidemicus. On the other hand, two ordinary strains, one from scarlet fever and another from mastoiditis, did not change with twenty-six passages through mice, although virulence was markedly enhanced.

For the present it would be best to consider Streptococcus epidemicus from the point of view of its behavior in man and in animals and its peculiarities in the production of disease. Although it constitutes perhaps 10 per cent or less of the hemolytic streptococci of those we have studied, it is the outstanding if not the only organism that causes milk borne epidemic sore throat. The capsules and large colonies may be associated with greater invasiveness. In recent experiments[15] after mere smearing of the teats of cows with cultures of Streptococcus epidemicus, mastitis developed, illustrating the great ease with which this organism may ascend into the udder and cause milk borne sore throat. In man, the more severe forms of streptococcus sore throat may be due to Streptococcus epidemicus, which is responsible for a greater frequency of complications, particularly peritonitis and meningitis.

CONCLUSIONS

1. Sporadic sore throat most often is due to hemolytic streptococci; the streptococci in 10 per cent of the cases corresponded in their cultural characteristics to the Streptococcus epidemicus of epidemic septic sore throat.

2. Septic sore throat due to Streptococcus epidemicus in its usual form is sporadic. The epidemic type is unusual, requiring the development of a streptococcus mastitis in the cow whose milk becomes the source of the epidemic.

3. A carrier state for Streptococcus epidemicus may follow sporadic sore throat. Such carriers are probably responsible for the direct transmission of sore throat. The streptococci reside in the crypts of the tonsils; tonsillectomy is followed by their disappearance from the throat.

4. In its clinical manifestation, sporadic sore throat due to Streptococcus epidemicus varies from very mild to severe types. Patients devoid of tonsils may be affected and may give symptoms of an infection of the upper respiratory tract, in some ways resembling influenza.

5. Complications may arise immediately, such as otitis media, mastoiditis and cervical adenitis; sequelae may develop from ten to thirty or more days after the onset. Acute polyarthritis, endocarditis, glomerulonephritis and erythema nodosum were the most noteworthy and were often associated with mild recrudescent sore throat and fever.

12. Pilot, Isadore: Toxins of Streptococcus Epidemicus of Epidemic Septic Sore Throat, J. Infect. Dis. 49: 135 (Aug.) 1931.
13. Tunnicliff, Ruth: Streptococci from Scarlet Fever, Erysipelas and Septic Sore Throat, J. A. M. A. 94: 1213 (April 19) 1930.
14. Pilot, Isadore; and Dryer, I.: Differentiation of Toxin of Streptococcus Epidemicus from Toxin of Scarlet Fever Streptococcus, J. Infect. Dis., 49: 137 (Aug.) 1931.
15. Pilot, Hallman and Davis (footnote 4). Frost, W. D.; Hadley, F. B.; Davis, J. D., and others: Experimental Infection with Streptococcus Epidemicus of Monkeys and Cows, Tr. Am. A. M. Milk Commission, June, 1930.

6. The complications and sequelae were due to Streptococcus epidemicus. The appearance and disappearance of these organisms in the throat frequently could be demonstrated with the development and termination of the complications.

7. Streptococcus epidemicus constitutes probably a group among the hemolytic streptococci. Its capsule and large colony formation appears to be identified with an aggressiveness greater than that of ordinary hemolytic streptococci and with a peculiar tendency to cause fatal peritonitis and meningitis. Its exact status remains unsettled.

8. Streptococcus epidemicus produces toxin which gives skin reactions in man specifically different from toxin of streptococci of scarlet fever. Injected into animals, the toxin leads to the formation of an antiserum with neutralizing properties.

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ABSTRACT OF DISCUSSION

DR. ANNA W. WILLIAMS, New York: In the New York City Health Department, we have been interested in the classification of these different types of streptococci and in their relationship to beta hemolytic streptococci in general. We have been using intensively the absorption of agglutinins test in these studies. We have several strains designated Streptococcus epidemicus from the older epidemics, among these the historic strain of Davis and a number of strains from the large epidemics that occurred in Massachusetts in 1928 as well as several of our own from scattered cases of "septic sore throat." We have found so far that the Davis strain and two or three others from the older epidemics fall into one group by the absorption of the agglutinins test. This we have called epidemicus type I. We found another agglutinative group from some of the Massachusetts strains. This we have called epidemicus type II. We have discovered lately that the strains of this type II are by absorption a subgroup of our smallest erysipelas group E type II. We have also found other strains belonging to this subgroup, so now our epidemicus type II group (Erysipelas subgroup II) is composed of a large number of strains. These strains as well as those from erysipelas all show growth characteristics similar to those described as belonging to the epidemics. The question as to the worth of these cultural characteristics as well as that of a capsular space, in determining species classification, is unsettled. This is an interesting and important group from the standpoint of epidemiology, and we believe that the absorption of the agglutination test of all these strains must be studied with complete cross absorptions and full controls before we can arrive at their definite classification. The exotoxins we have tested from these strains act precisely as do our exotoxins of beta hemolytic streptococci from other sources; that is, in some people they are fully neutralized by the serum stimulated by the exotoxin from any other strain. On the contrary, the endotoxins, which are the chief cause of the lesions in septic sore throat, are more specific and correspond to the agglutinative type of the invading strain.

DR. A. C. IVY, Chicago: I should like to ask the authors whether, when tonsillectomy is performed in these carriers, the postoperative course is complicated. I should also like to ask whether they have seen any temporary increase in blood pressure as sometimes encountered in influenza.

DR. ISADORE PILOT, Chicago: With reference to the absorption agglutination test, at first we had distinct, specific results with the epidemic strains. We have obtained such results with those from the Lee epidemic (1928), a strain from 1911 and others. Some of our sporadic strains have not fallen into a group. Whether they are a distinct, specific group is still an open question. With reference to capsules, we had some interesting discussion. We have observed encapsulated streptococci that do not give cultural characteristics of Streptococcus epidemicus. We therefore emphasize primarily the cultural characteristics, the production of the large colony which becomes wrinkled. The capsules are largely confirmatory evidence. One of the most striking phenomena, I think, is that Dr. Davis's strain of 1911 had lost its cultural characteristics and with mouse passage it now grows just as typical as the fresh strains from the New York and Baraboo epidemics. With reference to tonsillectomy with this organism or any particular streptococcus in the throat, it seems to most physicians remarkable that there are no complications when the tonsils are taken out. Some older studies showed that practically 100 per cent of tonsils contain hemolytic streptococci. Yet, from the enormous number of tonsillectomies that are done, very few reactions are seen. It is probably due to the fact the tonsillectomy, as most clinicians know, must be performed when there is no active, acute infection. We always insist that at least five and preferably six weeks or more must elapse after any acute manifestation in the throat before we advise tonsillectomy. With reference to the question on blood pressure, by Dr. Ivy, we have not made any observations.

THE MANAGEMENT OF ACUTE BRAIN INJURIES

WITH ESPECIAL REFERENCE TO THE INDICATIONS FOR OPERATION *

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The rapidly increasing number of brain injuries constitutes a problem of great interest to nearly all departments of clinical medicine. If one may judge from the vast literature on the subject, there still remains a wide difference of opinion as to the management of these cases. It has been customary in recent articles on the subject of head injuries to begin the discussion by stressing the importance of the brain injury rather than that of the associated fracture of the skull. It is obvious that injury to the brain is the important lesion in such cases, and the studies of the patient should be made with this idea in view. Fracture of the skull, however, should not be ignored, and the location and type of fracture often give definite indications of the site of the important intracranial lesion. The admitted necessity of operating on compound or depressed fracture of the vault as early as the patient's condition permits, the contrecoup brain injury so often found in occipital fractures, the possibility of middle meningeal hemorrhage in fractures of the temporal region, and the occasional complication of infection in fractures through accessory nasal sinuses all combine to keep alive interest in the subject of the fracture itself in order that there may be a better understanding of the more important intracranial damage.

It is my purpose in this paper to discuss certain observations made on a series of 596 patients who have received treatment in the Hospital Division of the Medical College of Virginia during a period of five years, closing Jan. 1, 1929. The methods employed in the treatment of this group will be briefly reviewed. Of these 596 patients, 453 had head injuries of sufficient severity to produce a demonstrable fracture of the skull or unconsciousness, or both. There were 275 demonstrated fractures of the skull in this series. Of the group of 596, 143 are excluded from consideration here because of the fact that, although they had head injuries requiring a stay in the hospital, they were injuries of a mild type. In the group of 453 under

* From the Department of Neurological Surgery, Medical College of Virginia.

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consideration, 78 cranial operations were performed, and of these operations 32, or 7 per cent, were subtemporal decompressions, 22 on the right side and 10 on the left. In the 453 cases there were 84 deaths, a mortality of 18.5 per cent, 34 patients dying in less than twelve hours, and 50 after this period.

It is admitted that little information can be expected from statistics of acute brain injury, because of the wide variation in the type of injury and the failure to determine the actual lesion causing the symptoms or death, in a large percentage of cases. The nature of the pathologic changes in head injuries, whether apparently mild or severe, is often not determined for many weeks after the injury has been received, and sometimes its effect on the brain can be made known only by encephalographic studies. The brief statistics of the series presented are given primarily to indicate my attitude toward operation.

My associates and I have tried to improve our methods of management of the patient in the early stages of his injury and so long as he remains unconscious or as the outcome of his condition is in doubt. Elevation of the head is preferred, provided the state of shock is not of such a degree as to make this unwise. Routine orders should include careful attention to the pulse rate and particularly to the variations of the pulse rate, which may take place rapidly and indicate that the mechanism for the protection against intracranial pressure is being severely strained. Changes in the respiratory rate and systolic blood pressure may be a part of the clinical picture of advancing compression, and these should be carefully observed. The lateral prone position in unconscious patients is generally desirable, and feeding by nasal tube should be employed in the unconscious patient or whenever there are difficulties of deglutition. Adequate general care is of paramount importance in promoting the recovery of the severely injured patient.

A very constant result of a serious head injury is shock. A brief comprehensive examination of the patient's condition is all that is needed when the patient is in severe shock, but this examination should determine as accurately as possible, without undue disturbance of the patient, the presence of focal signs and associated injuries. Injuries in other regions of the body, particularly those of the chest, are often overlooked in unconscious patients, and sometimes they may determine the outcome of the case.

The value of the routine roentgen examination of the patient with head injury is admitted, provided examination is postponed until recovery from shock and done at a time when it does not add any risk to the patient's condition. Roentgen examination of an unconscious patient may give very significant information when there are no gross signs of injury and no history of the patient is available.

After the patient has recovered from shock, studies should be begun to determine the seriousness of the intracranial trauma, the type and location of the fracture, if present, and whether or not intracranial pressure is developing.

The history of the accident, if obtainable, and such examination as is made of the patient in the early stages should be carefully recorded from time to time, because the difficulties of estimating the progress of the case are enormously increased if comparative studies cannot be made of the patient's condition.

Concussion following head injury is so differently understood that no attempt will be made to discuss the condition in this paper. We have regarded the very transient unconsciousness produced by head injury as an evidence of concussion, but it is highly probable that a demonstrable pathologic basis can be found in many patients with severe concussion. Serious head injuries usually, but not always, are followed by increased intracranial pressure. It is often difficult to determine, from clinical studies alone, whether the unconscious patient has or has not a rise of intracranial pressure, and we have operated on some patients in this series, although they were profoundly unconscious, forty-eight hours after the injury, without finding the brain under tension. It has been impressed on us that useless decompressive operations on such patients may be avoided by a determination of intracranial tension by spinal puncture. Prolonged unconsciousness may arise from gross damage to cerebral tissues in which there has been little reactionary edema or clots, and so far as can be determined some of these patients have no rise of intracranial pressure. Injuries to the pons produce immediate and profound unconsciousness but no rise of intracranial pressure. Edema is a natural result of trauma and contusion, and much is being written at the present time on methods of reducing cerebral edema in traumatic cases. While edema of the brain is a very constant effect of head trauma, the possibility of intracranial clots should always be borne in mind, whenever a patient has received a head injury of sufficient severity to stun him even momentarily. Le Count and Apfelbach,[1] in autopsies on 504 patients with fractures of the skull, found subdural clots weighing 20 Gm. or more in 176 cases. They state that in a few cases death was caused by edema. These statistics represent an accuracy as to the type of lesion which cannot be duplicated from clinical study alone. Intracranial pressure resulting from a combination of edema and subdural clots will obviously be lowered by reducing the edema, but relief of edema without removal of the clot is almost invariably inadequate. Thirteen large subdural hematomas were found in 173 skull fractures in this series,[2] and I have received the impression that, when patients have high intracranial tension following trauma, there is usually some other factor combined with edema.

Spinal puncture gives very definite information as to subdural hemorrhage in a large majority of cases. It is doubtful, however, whether bloody fluid can be removed in any considerable quantity from over the cerebral cortex by spinal puncture. It is highly probable, when the spinal fluid contains a large percentage of blood, that the injury is about the base and the blood is poured directly into the large cisterns. Bagley,[3] in valuable experimental work, has shown that the presence of blood in the cerebrospinal fluid, even without associated trauma to the brain, produces definite pathologic alterations in the central nervous system. His observations indicate that this bloody fluid should be removed, provided there is no contraindication to spinal puncture. There has been no experimental work, so far as I know, which would indicate that removal of cerebrospinal fluid after injection of blood into the cisterna magna would prevent the changes that Bagley found in young puppies. It is highly probable that

1. Le Count, E. R., and Apfelbach, C. W.: Pathologic Anatomy of Traumatic Fractures of the Cranial Bones and Concomitant Brain Injuries, J. A. M. A. **74**: 501 (Feb. 21) 1920.
2. Coleman, C. C.: Intracranial Hemorrhage Following Head Injury, South. M. J. **21**: 697-701 (Sept.) 1928.
3. Bagley, Charles, Jr.: Blood in the Cerebrospinal Fluid: Resultant Functional and Organic Alterations in the Central Nervous System, Arch. Surg. **17**: 18 (July) 1928.

most of the fluid that one obtains at lumbar puncture comes from the ventricles and large cisterns. Fluid from these sources, if not withdrawn, might serve a useful purpose in diluting small collections of blood and facilitating the disappearance of this blood from the fluid spaces. In some cases I have seen the fluid become more bloody after the first spinal puncture, and the question was raised as to whether the sudden lowering of pressure did not precipitate a fresh hemorrhage.

Extradural hemorrhage still remains a problem in intracranial trauma. Frazier [4] thinks that less than 50 per cent of the cases are recognized, and Moody [5] found at autopsy 100 extradural hemorrhages, of which number only 37 were recognized clinically. In the 504 skull fractures which Le Count and Apfelbach reported, there were 104 extradural hemorrhages, weighing from 20 to 246 Gm. There can be no doubt that both extradural and subdural hemorrhages are much more frequent than is generally believed, and the mortality of intracranial clots of all kinds continues to be high. When a patient dies within the first five or six hours after injury, the fatality may generally be regarded as having been inevitable, except in a few cases of extradural hemorrhage. When, however, death occurs after recovery from shock, the question must always be raised as to whether the patient died as a result of increased intracranial pressure and whether or not he received adequate treatment for this condition. The death of the patient after recovery from shock may be caused by unavoidable infection, extensive cerebral lacerations or uncontrolled intracranial pressure.

The majority of cases of brain injury do not show either subdural clots, extradural hemorrhage, or depressed or compound fractures, but they do show a rise of intracranial pressure. Relief of intracranial pressure by decompressive operations has fallen into considerable disfavor in recent years, and, as a substitute, spinal puncture, hypertonic solutions and dehydration are being employed. We have used spinal puncture guardedly in the examination of most of the patients with acute brain injury severe enough to require treatment directed to the intracranial condition. The proper employment of spinal puncture gives added information, not supplied by clinical examination, as to the degree of intracranial pressure. There is danger in the use of spinal puncture when there is a rapidly developing compression, such as is produced by extradural hemorrhage. The patient should be studied carefully before the spinal puncture is done, and I believe that it is unwise to drain spinal fluid to the last drop even though the fluid is very bloody. If the pressure is elevated, we have followed the rule of reducing it to about half of its original level. Some patients presenting headache, irritability, and bloody or xanthochromic spinal fluid persisting for some days will be greatly relieved by single or repeated spinal punctures. As a rule, however, I consider spinal puncture of more value as a test for pressure than as a therapeutic measure.

Hypertonic solutions will undoubtedly reduce intracranial pressure, and, if administered in combination with dehydrating agents and purgatives, fluids will naturally be drawn from the body. In cases with moderate pressure, this combination of palliative measures is usually sufficient to lower the pressure, but in those patients with life at stake it is difficult to say whether the end-results would not be about the same if these measures were omitted. The effect of hypertonic dextrose is temporary, and, if active dehydration is employed in order to maintain the effects of the hypertonic dextrose, one may wonder whether a well conducted subtemporal decompression under local anesthesia would not give the patient greater and more lasting benefit. It has been thought by some that spinal fluid is produced in larger quantities after a brain injury, but so far as I know it has never been asserted that the repeated removal of spinal fluid at lumbar puncture and the administration of hypertonic solutions and magnesium sulphate will maintain continuously a lowered pressure. On the other hand, there have been a few cases in the series in which dehydration appeared to be distinctly harmful and recognized improvement of the patient's condition took place on discontinuance of the treatment. The harmful effect of too energetic dehydration or of misapplied dehydration does not, to my mind, indicate that that measure is not useful in many cases but that it should be used with care and with the idea in mind that it may be inadequate to control pressure.

There is a general agreement as to the treatment of head injuries when certain results are produced, such as scalp lacerations, compound or depressed fractures and gross intracranial clots. Scalp lacerations are usually disinfected and excised as soon as the patient's condition allows this simple procedure. The proper treatment of scalp lacerations, however, is too often neglected, and troublesome infections are frequently found after such lacerations.

The treatment of depressed fractures of the vault which have lacerations of the dura and underlying brain should be extended to include measures which limit the amount of scar formation in the brain tissue. This is very important if there is a laceration of the motor cortex. Excision of the contused brain, with careful control of bleeding and repair of the dura, is probably of much greater importance in the management of these cases than the elevation of the depressed bone. Compound fracture, particularly of the frontal fossa, with a cerebrospinal fluid leak should be operated on as soon as the patient has recovered from shock, and the rent in the dura should be repaired with a fascial strip. The difficulty of recognizing the presence of a subdural clot in severely injured patients is generally appreciated. These patients have usually received extensive lacerations of the brain tissue and are frequently profoundly unconscious from the time of injury. We have found the study of the pupils to be of invaluable help in localizing clots, both of the subdural and of the extradural types, but little information has been obtained, in the study of our cases, by examination of the eyegrounds in the early stages of the injury. We have found a dilated and fixed pupil of greater significance in the localization of the clot than hemiplegia, and in cases presenting a dilated pupil and hemiplegia on the same side the clot is usually found on the side of the dilated pupil. Care is necessary in the interpretation of the pupillary changes, however, in some cases, if the patient has received a fracture of the base (which may be indicated by ecchymosis around the eye and bleeding from the nose). In such a case the third nerve may have been directly injured and, consequently, the dilatation of the pupil would not be significant as to the presence or location of an intracranial clot.

4. Frazier, C. H.: Surgical Management of Cerebral Trauma, Pennsylvania M. J. **33**: 466-470 (April) 1930.
5. Moody, W. B.: Traumatic Fracture of the Cranial Bones, J. A. M. A. **74**: 511 (Feb. 21) 1920.

The slow pulse rate so often found in head injuries may or may not be significant as an indication of intracranial pressure. The whole clinical picture must be taken into consideration and special thought should be given to the state of consciousness, respiration, blood pressure, pulse rate and intracranial pressure, as determined at spinal puncture. A slow pulse rate with a high blood pressure, particularly in young people, combined with deep stupor and bloody spinal fluid, indicates the need for operative relief by subtemporal decompression and drainage. In a few of these cases, clots may unexpectedly be found, and in others there is a marked accumulation of fluid, as pointed out by Naffziger.[6] A small decompression and release of fluid is all that is needed in the cases with collections of subdural fluid. In the severe types of injury, in which there is a high grade intracranial pressure with unconsciousness and, generally, a bloody spinal fluid, operation will usually show the brain to be markedly contused and under great tension, when the dura is opened. I believe that the majority of these patients have clots and that they are not adequately treated if only spinal puncture, dehydration and hypertonic solutions are used. My experience indicates that such patients need a large subtemporal decompression, to which may be added postoperative spinal punctures and the palliative measures now used to the exclusion of subtemporal decompression. If the patient's restlessness should make it necessary to employ a general anesthetic, I have noted this fact as a relative contraindication to operation, which may be set aside, however, if other features of the case urgently demand operation. We have used morphine in the treatment of head injuries perhaps more freely than is the practice in other clinics. It should be used with great judgment, and certainly its use should be prohibited if there is evidence of marked intracranial tension. Many patients, however, appearing to have cortical injuries with irritation (possibly by blood), with extreme restlessness and at times maniacal behavior, often do not have any rise of intracranial pressure, and their restlessness must be controlled. If it can be done by the use of simple drugs, such as phenobarbital, chloral hydrate or bromides, this is to be preferred. If, however, these drugs fail to control the restlessness, we have no hesitation in giving morphine.

SUMMARY

It is well known that the large majority of patients with head injuries recover with general nursing care. The mortality is and probably will remain inevitably high in those patients severely shocked from extensive damage to the basal structures and widespread laceration and contusion of the brain. A smaller group, because of high intracranial pressure due to contusion with edema and to subdural and extradural hemorrhages, will require a subtemporal decompression or some form of operation for removal of the clot. Our series shows that subtemporal decompression with drainage was done in more than 7 per cent of the cases, to offset intracranial pressure when there were no localizing symptoms. In our experience, palliative measures, such as dehydration, hypertonic solutions and therapeutic spinal puncture, cannot be advantageously substituted for subtemporal decompression with drainage in all cases of brain injury. The patients in our series who urgently needed relief from compression have done better with operation, frequently combined with these more simple measures. If it is necessary to use ether anesthesia in order to perform a subtemporal decompression, this should be noted as a relative contraindication to operation, but the urgent need for relief from pressure may nevertheless require operation. Cranial operations for trauma can generally be done with local anesthesia.

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6. Naffziger, H. C.: Head Injuries; Indications for Surgical Treatment, S. Clin. North America **3**: 699 (June) 1923.

ABSTRACT OF DISCUSSION

DR. CHARLES BAGLEY, JR., Baltimore: The subject of cerebral trauma is difficult to discuss in a short time because of the wide variety of lesions found in patients after head injuries. I am convinced that the cases must first be classified according to the type of skull or brain injuries. Clinicopathologic studies enable one to correlate the signs and symptoms of cerebral trauma with definite cerebral lesions. I shall therefore use the time allotted in discussing two types of symptoms which are most helpful in the grouping and treatment. First there is the classic pressure syndrome characterized by slow cardiac and respiratory rate, subnormal temperature and stupor of a varying degree. The lesion here may vary from an edema which will soon pass off to a large localized clot requiring removal. Second there is the syndrome characterized by irritative symptoms, restlessness, rapid pulse, moderately elevated temperature, cervical rigidity and positive Kernig sign and often leukocytosis. These patients are usually found to have bloody cerebrospinal fluid with sterile meningitis. If let alone many of them will struggle through a tedious course and recover after absorption of the fluid. Removal of the irritating fluid by lumbar punctures or subtemporal drainage is advisable in the majority of cases and absolutely necessary in some. These groups do not include the patients seriously ill and prone to die within the first few hours after the injury, about whom Dr. Coleman is concerned at this time. These patients are of course poor surgical risks and, as Dr. Coleman has shown, palliative measures must usually be depended on; but care must be taken not to overlook cases with large localized clots, especially those of the extradural type.

DR. FRANCIS C. GRANT, Philadelphia: In considering cases of cranial trauma, one must remember that it is not the injury to the skull but the damage done to the underlying brain that determines the outcome. The limitations of surgical treatment in these cases must be kept in mind. Surgery can prevent meningitis and relieve intracranial tension, but a lacerated or contused brain cannot be repaired by surgical means. All that can be done is so to manage the case that the reconstructive processes of the body are given the earliest possible opportunity to repair the damage under normal conditions. The treatment of intracranial pressure becomes then the crux of the situation in these cases. How best can this be accomplished, by decompression or by lumbar puncture plus dehydration? I feel that decompression should be used practically exclusively in those instances in which there is increased intracranial pressure plus clear evidence of an expanding lesion. Extradural or subdural hemorrhage are the two classic indications for operation. Unless a definite diagnosis of either of these conditions can be made, I rarely operate. Increased intracranial pressure, if present, can be just as readily controlled by hypertonic solution of dextrose administered intravenously and by lumbar puncture. I have never seen properly performed lumbar puncture have any ill effect. In handling these cases, two objects must always be kept in mind: The first is to save the patient's life. The second is to prevent the occurrence of posttraumatic sequelae (headache, vertigo, epilepsy) so that the injured man may return as rapidly as possible to his former occupation. Now, unfortunately, I have no large parallel series of cases, one group of patients all treated by decompression, a second by the expectant palliative nonoperative method. If I had two such series I could then determine with accuracy which scheme of treatment returned most patients to their jobs with the fewest sequelae. This is unquestionably a highly important aspect of the cranial trauma problem which is frequently overlooked. At the present time, it is my impression, which, however, I cannot support with

figures, that more of those patients in whom a decompression has been performed have been handicapped later on by unfortunate after-effects than in the group in which operation was avoided; but in this connection it must be remembered that only the more seriously injured patients were operated on.

DR. MAX PEET, Ann Arbor, Mich.: I agree with Dr. Coleman on practically every point he has made and differ only on the advisability of lumbar puncture and the relief of intracranial pressure by the use of hypertonic solutions rather than by subtemporal decompression. I have had several opportunities to note the improvement following the administration of hypertonic solutions in patients who had already had unilateral or bilateral subtemporal decompressions. I admit that that is not an absolute comparative series, but to have an individual who has had the operation and still remains in deep coma with a slow pulse and respirations return to consciousness, perhaps in fifteen, twenty or twenty-five minutes after the administration of dextrose solution and have it happen sufficiently often so that it cannot be just a coincidence, convinces me that the routine administration of hypertonic solution of dextrose is really of greater decompressive action than subtemporal decompression. In adults I recommend 100 cc. of 50 per cent solution of dextrose intravenously. I believe that in the majority of cases a subtemporal decompression relieves pressure over only a comparatively limited area, and certainly many patients have to have a bilateral subtemporal decompression. It is well known that patients can have an increased intracranial pressure, in fact a fatal increase in pressure, and still be in profound shock. I have found in such cases that the administration of hypertonic solution of dextrose is not only beneficial in decreasing the intracranial pressure but is also of great value in combating the condition of shock. I hesitate always on lumbar puncture because of the possibility that I may be increasing a hemorrhage which has already taken place. On the other hand, I believe that there are times when lumbar puncture is a life-saving measure. I particularly refer to the patient that is seen immediately after an accident or is brought in within a few minutes and in whom there is every indication of an exceedingly rapid increase in intracranial pressure, with a possibility of early death. Although obviously there may be hemorrhage taking place, I believe that lumbar puncture is definitely indicated, for the following reason: It is known that the medulla can stand a certain amount of pressure, at a given time. That pressure can be increased enormously if the increase is gradual, but the medulla can stand only a little pressure if that pressure is applied rapidly.

DR. HARRY MOCK, Chicago: Only 13 of 100 patients studied required operation. Of that 13, 6 required it because of definitely depressed skull fracture, and 3 required it because of middle meningeal hemorrhage, leaving 4 in the questionable group, and of the 4 cases, 2 were early decompressions which I did because I thought the patients were going to die and I might save them. They died just the same. I think that, as a group, surgeons should get together on this subject, and in trying to carry out that idea I have the names of over 100 men from all parts of the country who are willing to report their skull fractures next year on a uniform card, and I hope to come back with 500 or 1,000 cases next year for the exhibit, telling just how the patients were treated. From statistics gathered from these cases, I shall endeavor to ascertain whether dextrose solution or dehydration is the ideal, whether lumbar puncture is justified or not justified, or whether one must go back to the decompression period again. A study of the statistics gathered from the literature covering 20,000 cases since 1900 shows that the highest mortality rate in skull fractures was in that second decade, 1910 to 1920, when most of the articles were lauding subtemporal decompressions. Since 1920 there has been a definite decrease from 49 per cent gross mortality down to 25 per cent gross mortality, and there has been a definite reduction from 26.6 per cent operative procedure to 10.5 per cent operative procedure in skull fractures. So it seems to me that with dehydration and lumbar puncture the percentage of operations has been reduced and the reduction has been accompanied by this very definite decrease in the mortality rate.

DR. CLAUDE C. COLEMAN, Richmond, Va.: The discussion shows that there is little important difference of opinion as to the management of these cases. I agree with what Dr. Bagley has to say about the benefit of removing bloody fluid in certain cases. It is extremely difficult to get statistics of any value either as to mortality or as to the type of lesion in traumatic head cases. No two cases are alike. One cannot accurately determine the value of any particular method of treatment, because different methods of treatment are not used on the same patient. If reliance is placed on subtemporal decompression in a particular case, one cannot say that he might not have been benefited by hypertonic solution of dextrose and dehydration with spinal puncture. This is one of the difficulties that I have found in trying to get standardization of treatment. In reference to the objection made by Dr. Grant as to a subtemporal opening in the skull, I doubt whether this should be given any great weight. Of course, a decompression does leave a permanent defect in the skull, but if these patients have neuroses following the injury, they are more likely to come from the damage to the brain than from the opening in the skull. As to the localized effect of decompression brought up by Dr. Peet, I think that a subtemporal decompression, whether done for tumor or for trauma, will affect the general intracranial pressure, and if in doing a decompression for trauma one finds a clot, this can be removed. If a clot is not found, I believe that a classic subtemporal decompression, usually on the right side, will lower the general intracranial pressure. In the 453 cases reported in this paper, all with brain injuries, including the severest types in which death occurred within a few minutes after injury, there was a mortality of 18.5 per cent. The cases have been analyzed in order to call attention to the views that I hold, that in the severe types of pressure one must not only utilize the palliative measures of hypertonic solutions and dehydration with spinal puncture in properly selected cases but also give the patient additional help in a small group of cases, by a subtemporal decompression.

THE DUCTLESS GLANDS AS THEY APPERTAIN TO EYE DISEASES AND TO SURGERY*

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Any one associated with a medical organization that has much to do with people who have endocrine disturbances will be impressed by the large number of such individuals who present ocular changes. In the study of these cases it becomes of increasing interest to find that these pathologic changes in the eyes not only can but must be due to the deficiencies of the internal secreting glands.

In only a few cases is it possible to identify one gland as responsible for the ocular condition, for usually more than one is causing trouble. Until better methods of study of the endocrine glands are introduced, and better surgical operations are performed on those which are at fault, disorders of the thyroid and of the pituitary will continue to be considered as the principal causes of diseases of the eye which are amenable to surgery.

In this connection, I wish to record the recent work of Dr. G. W. Crile on the suprarenals. There is a group of cases the symptoms of which simulate those of hyperthyroidism, in which the condition is frequently called neurasthenia or neurocirculatory asthenia. In these cases the eyes may present all the changes that are associated with hyperthyroidism except exophthalmos. Such cases appear to be benefited by denervation of the suprarenals. (As a matter of interest, it may

* From the Cleveland Clinic.
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be mentioned that studies of the ocular tension in these cases have not as yet revealed any constant rise or fall in intra-ocular tension.) These cases must be followed further for we have seen but sixty of them and until we know more about them, a definite report cannot be made. Nevertheless as the result of a careful review of these sixty cases, Dr. J. Lehman reports that the best results were obtained in those in which the symptoms of hyperthyroidism were very closely simulated. These patients have a rapid pulse, widening of the palpebral fissures with no exophthalmos, some weakness of accommodation convergence, tremor on closing the eyes, and no difficulty of eversion of the lids. They do tend to have larger pupils, but no true exophthalmos has been seen. The eye signs all disappear after the suprarenals have been denervated. It must be realized that these patients would not be benefited by a thyroidectomy; as a matter of fact, I believe that it is in such cases that postoperative hypothyroidism develops with the progressive exophthalmos which all too frequently accompanies this condition.

Every one has had experience with cases in which diseases of the eyes have been associated with thyroid disturbance and with the effects of thyroid surgery. The following statements regarding this relation are based on my personal records of approximately 1,500 cases of diseases of the thyroid gland, in 1,000 of which the condition of hyperthyroidism was present when the patient was first examined by me. I do not present this, however, as an isolated report of such observations for there have been many well presented reports of such cases. Those of Dr. Holloway and Dr. Murray of Minnesota are excellent examples of the large numbers of these cases which exist throughout the country. The literature presents many case reports, most of them, however, made by surgeons few of whom record the eye signs accurately. Unless actual measurements are made, the eye changes cannot be correctly interpreted. Photographs are extremely misleading.

Before beginning a discussion of the diseases of the thyroid gland that are associated with eye changes, it is necessary to identify the clinical group of diseases of the thyroid which I use here. I consider only cases of hyperthyroidism with or without adenomatous changes, for thyroid disease without toxicity as a rule does not produce eye changes.

In this group of cases, retraction of the upper lid is an earlier sign of eye change than is exophthalmos and is present in a higher percentage of cases than exophthalmos. It is frequently unilateral and frequently unequal. The wide retraction of the upper lid is associated with some orbicularis tension which offsets it. This first and most common eye sign accounts for many of the other eye signs—the staring, the difficulty of eversion, the infrequency of winking, the tremor on closing. Secondarily it accounts for the photophobia, because of the complete uncovering of the pupil and the iris; the excessive tears due to exposure, and the associated conjunctivitis catarrhalis thyroiditis. This is the type of case in which a corneal ulcer may develop. Retraction of the upper lid is the eye condition most helped by thyroidectomy—the wide retraction of the lids is almost immediately benefited and with it the appearance of the patient.

Patients belonging to this group of cases with wide retraction of the lids are frequently photographed before and after operation to show the end-results of thyroidectomy in its effect on exophthalmos. However, in but few cases are any actual measurements given.

Widening of the palpebral fissure is an entirely separate eye sign which occurs frequently unaccompanied by exophthalmos. It is greater, however, when it is associated with protrusion of the eyes. Exophthalmos also occurs separately with little or no widening of the fissures and in some cases with extreme palpebral spasm on one side, while the other fissure may be narrowed in spite of the presence of definite exophthalmos.

Exophthalmos is present only in cases of hyperthyroidism. If there is no toxicity, there is no protrusion of the eye. We have never had a case of unilateral exophthalmos in a case of hyperthyroidism; all cases of unilateral exophthalmos have been cases of pseudo-exophthalmos due to unequal or unilateral retraction of the lid. In a series of 100 cases, exophthalmos developed following thyroidectomy and in one of these cases extreme unilateral exophthalmos was present for a period of three months accompanied by severe hypothyroidism. In another case of postoperative unilateral exophthalmos a large mucocele was found to be present on roentgen examination.

Thyroid surgery has been found to be of great benefit in cases of exophthalmos. The progress of the protrusion is halted; ulcers are healed, and other eye signs due to exophthalmos show improvement. The average amount of decrease of protrusion is between 2 and 3 mm., the amount of protrusion varying slightly in the two eyes—rarely over 2 mm. The degree of protrusion is no indication of the degree of toxicity present and may be as great as 19 mm. over the high normal of 20 mm. which we have established for our series after measuring the protrusion of 1,000 normal eyes. Anterior luxation does not occur when the disease is diagnosed early enough and treated surgically. It may be necessary to operate earlier in the presence of cardiac complication or even in severe disturbances of the nervous system.

That group of cases which is extremely annoying to the surgeon and the ophthalmologist is that in which exophthalmos develops postoperatively. Fortunately, there are not many of these; but, since the exophthalmos progresses slowly, there is a tendency to consider the condition as a recurrence of hyperthyroidism and to perform a second operation whereas these patients already have a deficient thyroid secretion. These are cases of transitory hypothyroidism and they present several other features, such as progressive lowering of the basal metabolism rate, and edema as seen in the case of myxedema (upper and lower lids); no widening of the lids is present except that which is due to the exophthalmos. These patients do not stare; there is no difficulty of eversion; but there is a great deal of weakness of accommodation convergence. Active treatment with thyroid extract offers these patients the greatest relief. In our series the group in which exophthalmos developed postoperatively did not have severe eye signs before operation in the form of exophthalmos due to hyperthyroidism but rather in that form which is noted in association with suprarenal dysfunction or polyglandular disturbance. From my observation, this type of patient does not have an extremely high metabolic rate or a very rapid pulse rate but may present all the other signs of hyperthyroidism.

Disturbances in muscle balance and isolated muscle palsies are common in cases of hyperthyroidism, but whether or not these conditions are due to exophthalmos is a question. There are numerous cases of isolated

paralysis, such as that of the external rectus muscles and most frequently the right external rectus. The superior recti, especially the right superior rectus, are most frequently involved. The muscle changes do not clear up to any great extent after operation and may require further operative treatment later on. In six cases in which a squint operation had been performed, after a long period of time the eyes were found to be in maximum divergence or convergence, the opposite of the condition for which operation had been performed.

Weakness of accommodation convergence is the most common muscle disturbance and persists postoperatively, frequently delaying the return of the patient to normal and preventing his assuming his previous occupation. Muscle exercises and prisms for close work are sometimes of some benefit for this condition.

In our series of cases of hyperthyroidism there were eleven cases of increased intra-ocular tension, in none of which were any fundus changes of glaucoma present and in none of which were there any field changes or loss of vision. All but one of these patients returned to normal immediately after operation. This one case was that of a woman with myopia with a persistent tension in excess of 30 (Schiötz). The condition was controlled by the use of physostigmine. In all of these cases a great degree of protrusion was present with severe toxicity; all the patients had severe headaches, which also disappeared postoperatively.

In an ever enlarging group of cases of weakness of accommodation convergence, rapid fatigue, increase in body weight and all other symptoms usually associated with a mild postepidemic encephalitis, a low basal metabolism is found ranging from minus 10 to minus 40. These individuals are all benefited by the administration of thyroid extract replacing the nux vomica and other stimulating tonics that were formerly used. Disturbances of the eye muscles are commonly associated with general disability, and the possibility that hypo-endocrinism with poor muscle balance is present must always be considered.

With the ever increasing number of thyroidectomies and also the number of severe cases in which surgery is always hazardous though necessary, there may be an involvement of the parathyroid glands—either by their accidental removal or by their involvement in the postoperative scar, or perhaps by the temporary cutting off of their blood supply. There is undoubtedly a group of cases in which tetany is present before operation—those cases in which the patient complains of transitory blurring of vision, or spasm of the ciliary muscle. A large percentage of these patients have refractive errors that have varied several diopters even after a recent examination. Our records show that in over 60 per cent of thyroid cases refractive errors were present for which new glasses had been prescribed three months prior to the necessary surgical operation.

Although routine examination in the following group of cases did not reveal preoperative changes in the lens, postoperatively eye changes occurred as follows: sudden and spasmodic blurring of vision, becoming more frequent in association with some photophobia and then occurring for longer periods and, in some instances, soon accompanied by a haziness of vision. Examination at this time revealed a deposit along the posterior cortex which was granular to flaky in character. This condition progressed and appeared to form spicule-like changes, all posterior, in part as if the lens were thrown in folds. The spasms were of longer duration and lasted from a few minutes to three or four hours. In cases of this type, changes in the lens may progress rapidly to the formation of a complete cataract in one month or they may slowly progress over a period of several years. In all our cases, surgery had to be instituted because the condition was bilateral and because it was necessary in order to save the patient's vision. These patients had low blood content of calcium and of phosphorus, and other signs of parathyroid disturbance.

Just a word of warning in regard to eye surgery in these cases—the condition of the patient must be known before any operation is undertaken. The calcium report should be in the surgeon's hand before he operates; otherwise, he will have to contend with the most severe convulsive type of vomiting. This condition may be controlled by the administration of intravenous injections of 10 cc. of calcium chloride in 5 per cent solution, some sodium chloride being used before and after the administration of the calcium chloride to make sure that it flows easily and that it is washed in afterward. Dr. McCullagh, who has had these patients under observation, states that his best results have been obtained by the administration of two heaping teaspoonfuls of calcium lactate as often as every two hours, the dose being decreased as the blood calcium increased. He has found it unnecessary to use any other forms of calcium.

With this knowledge of the patient's condition, the surgical risk of thyroidectomy in these is the same as in other cases. In our own series of nine operations, good results were secured in seven; in two, good visual results were obtained in spite of iris prolapse. In both of these cases, severe vomiting occurred shortly after operation. All our patients were women under 50 years of age except two, one of whom was 52, the other 60. In all the cases in which cataracts formed, the condition developed directly after thyroidectomy. The question arises whether the cataracts are due to spasm or to low calcium content. These patients must be kept under medical observation and an attempt must be made to transplant parathyroids, although to date in cases in which this procedure has been attempted satisfactory results have not been secured. In 150 cases of deficient parathyroid secretion, cataract has been present in 10 cases, or 7 per cent.

Eye disorders are probably an involvement of disturbances of the pituitary gland as often as of disturbances of the thyroid gland, but on account of the inaccessability of the former the lack of proper methods of examination makes it difficult to find out whether this gland is responsible for the eye condition.

In a group of children with progressive myopia but otherwise normal, we found a very low dextrose tolerance curve and a low basal metabolic rate. We do not believe that enough time has elapsed for a complete report to be made of these cases. There is some constant factor in the production of the high degree of myopia and of hyperopia of the corneal disturbances, which range from high astigmatism to irregularities and keratoconus. These cases belong in the hypopolyglandular group. We have found two cases that were exceptions to this rule—both in women. In one, marked corneal irregularity was present. This patient had suffered from severe hyperthyroidism; her basal metabolic rate had fallen from plus 86 to minus 40. This condition was associated with a general glandular dysfunction. The other patient, in whom marked keratoconus was present, was in the hyper-

glandular state although she did not present a typical case of hyperthyroidism.

In a family of five boys, whose father and mother were second cousins, four of these boys (ages varying from 5 to 11 years) were blind. They were affected with hypopituitarism. In two of these cases the low basal metabolic rate indicated the presence of hypothyroidism. The blindness was due to a granule-like pigmentary degeneration of the retina (not a retinitis pigmentosa type). In two other cases, in both of which pituitary disturbances were noted, similar granular degeneration was present. These changes were more marked well out in the periphery.

The difficulty in the study of the endocrine glands has been the lack of accurate measurements, the passive interest of the general practitioner and the too aggressive interest of the endocrinologist.

CONCLUSIONS

The following facts are noteworthy:

1. Frequently it is found that patients who are examined for glasses have a muscle imbalance which may be due to hypothyroidism or other glandular dysfunction.

2. Hyperthyroidism produces definite eye changes, which in most cases are benefited by surgery; namely, wide fissures, ulcers and exophthalmos. Associated muscle changes are little benefited by any treatment, medical or surgical.

3. In parathyroid tetany, lens changes are sometimes present, probably the result of a combination of spasm with a deficiency of calcium and phosphorus.

4. Dysfunction of the pituitary gland is a causative factor in certain retinal disturbances and is an associated factor in other eye changes probably of polyglandular origin.

5. The recent work of Dr. Crile also brings out a group of cases in which suprarenal dysfunction is associated with eye changes.

ABSTRACT OF DISCUSSION

DR. GEORGE W. CRILE, Cleveland: I should like to call attention to the function of the thyroid, namely, that the thyroid governs the activity of every cell in the body. Therefore, if the functioning of a cell is depressed or increased, the rôle of the thyroid may well be looked into. Exophthalmos commonly is associated only with hyperthyroidism. It is not strange that this disease has been called exophthalmic goiter, because there is no organ of the body that is more delicately balanced than is the eye, and it is quite clear that whatever the function of the eye may be, whatever its mechanism, its activity is increased in a case of hyperthyroidism and diminished in the case of myxedema. Not only is it true of the musculature of the eye, but I think it might well be true of the concentration of ions in the various portions of the eye. Dr. Ruedemann seems to be of the opinion that in exophthalmic goiter there may be serious disturbances in the distribution of ions. The next point is the relation between the suprarenal sympathetic system, which itself is governed by the thyroid, and the problems of the eye. The suprarenal sympathetic system exerts a control over the eye, but the suprarenal sympathetic system in hyperthyroidism is stimulated. In hypothyroidism the activity of the suprarenal sympathetic system is lessened. Therefore, either hyperthyroidism or hypothyroidism would affect the eye profoundly, as is seen in exophthalmos associated ith hyperthyroidism. I am hoping that Dr. Ruedemann's studies will lead to an understanding of the mechanism of exophthalmos. I think it will be interesting to compare the eye symptoms before and after denervation of the suprarenal. The relation between the parathyroids and the calcium metabolism should have a wide significance. In certain diseases of the bones, there has been found excessive activity of the parathyroids. When there is a deficiency of parathyroid, one has tetany. With respect to the eye, I think the solution of some of the important problems will be found along the line of further studies such as Dr. Ruedemann is making. Dr. Ruedemann's work is of great interest to the surgeon. Lastly, I think that the eye, not alone the musculature but the acuity of vision, must depend largely on the ductless glands. The eye, being a process of the brain projected through a hiatus in the skull, would be expected to respond to the thyroid balance in a manner similar to that of the other functions of the brain. There is a great difference between the acuity of vision in myxedema and the acuity of vision in exophthalmic goiter. In this difficult borderland the surgeon must depend on the oculist for light.

DR. WILLIAM ZENTMAYER, Philadelphia: Friedgood stated that Sattler, in 1885, pointed out the occurrence of exophthalmos in conditions other than exophthalmic goiter and independent of mechanical production resulting from cardiac, renal and hepatic lesions. In 1909, Barker and Haines found exophthalmos, von Graefe's lid sign, Stellwag's sign and Möbius' sign in chronic nephritis. They further noted that there was a coincident decrease in exophthalmos with a decrease in blood pressure and believed that the hypertension, as well as the exophthalmos, was due to the same cause, an opinion which Friedgood's observations seem to substantiate. He concludes that the eye signs hitherto considered classic of exophthalmic goiter have been noted with surprising frequency in conditions other than the Graves syndrome (neurasthenia, chronic atrophic arthritis, hysteria, petit or grand mal, postencephalitic disturbances, Parkinson's syndrome, pulmonary tuberculosis, duodenal ulcer, primary familial muscular atrophy, diabetes mellitus, paroxysmal auricular fibrillation and hypertension), and especially in essential hypertension. He believes the ocular manifestations are of little value in the differential diagnosis of the disease but of great importance in indicating objectively the actual state of toxicity in the sympathetic nervous system. The author states that the best results from denervating the suprarenals are obtained in those cases in which the symptom of hyperthyroidism is very closely simulated. How is this group of cases to be differentiated from hyperthyroidism? Is the absence of true exophthalmos sufficient on which to base a diagnosis? The meaning of the author's statement of belief that eye disorders are probably an involvement of disturbances of the pituitary body as often as of disturbances of the thyroid is to me not clear; but if it is to be understood to mean dysfunctioning of the pituitary body, it is questionable in the light of the rarity of ocular symptoms in tumors of the pituitary body aside from those which can well be explained by pressure or stretching. It is possible that the central scotomas may be explained by dysfunctioning. The author states that thyroid surgery has been found to be of great benefit in cases of exophthalmos. The progress of the protrusion is halted, the ulcers are healed, and other signs due to exophthalmos show improvement. As the average amount of decrease of protrusion is between 2 and 3 mm. and may be as much as 19 mm. over the high normal of 20 mm., this decrease would seem not sufficient to have much effect on the corneal ulceration; and when this complication is present, in my limited experience nothing short of tarsorrhaphy has brought about healing of the ulcers.

DR. DANIEL B. KIRBY, New York: I am sure that if Dr. Ruedemann had had time he would have spoken of the disturbances of the parathyroid and the production of lens opacities. I published a paper last year on a study of calcium in relation to cataract in which I cited investigations which proved that there was no evidence of any parathyroid deficiency in cases of senile cataract, the blood serum calcium of all such patients being at the upper limits of normal. Sufficient calcium in the diet of cataract patients is most important from the standpoint of their general health and nutrition, but it is far better to correct by systemic measures any disturbances that lead to excessive endogenous acid formation and excretion of calcium than to administer calcium salts or alkali waters to make up for the waste of calcium from the body. Before I knew that parathyroid therapy was not indicated in senile cataract, I had started three series of patients on injections of parathyroid extract. No beneficial action as far as their cata-

racts were concerned was observed. The matter of the prevention or arrest of lens opacities that occur in parathyroid deficiency cases, whether operative or otherwise, is a different story, as Dr. Ruedemann has shown. Lens epithelium grown in vitro will stand tremendous increases in calcium content of the nutrient medium, even up to the point of precipitation of the excess of the calcium, but will not permit of reduction of available calcium without cellular damage. In considering the matter of surgery in cases of hyperthyroidism, it is well to have in mind the reconstruction of the eyelid tissues that is necessary in certain of these patients. I have used, and have seen others use, Wheeler's method and found it highly satisfactory.

DR. T. B. HOLLOWAY, Philadelphia: Several years ago in conjunction with Dr. Fry I placed on record 100 cases of exophthalmic goiter, which work was undertaken with the hope of discovering some relation between the thyroid and the pituitary, as manifested by changes in the visual field. Unfortunately, we failed to find anything definite; but, curiously enough, immediately after that paper was published a patient did come to my office and her field was strongly suggestive. I think it was probably a coincidence, for I know it is not the rule in these cases. The author has referred to there being an absence of exophthalmos. I should like to know what method he used for determining the presence or absence of exophthalmos. The border line is very broad, but if I remember correctly in our studies we could not determine the existence of an exophthalmos until the exophthalmometer recorded a measurement between 17 and 18 mm. I should like to mention another point in the relation of the fields to pituitary cases in which there is diplopia without apparent associated muscle palsy: Beckman and Kubie, working with Gordon Holmes in London, made important observations in regard to this diplopia. After first briefly referring to binocular single vision they referred to miners' nystagmus. These men toil under poor illumination and under these conditions the perimacular vision is better than the macular vision, although it is subject to quicker fatigue and has no one point at which vision is better than at another. For this reason, while the eyes may oscillate and nystagmus occur, no diplopia develops. They then called attention to the fact that in certain pituitary body cases in which there is central scotoma, in all probability the extra-ocular muscles call into play points on the retina not previously associated, heteronymous fields, and as a consequence there is diplopia without involvement of the ocular muscle. I hope that those who come in contact with such cases will keep these observations in mind.

DR. A. D. RUEDEMANN, Cleveland: There were among these cases 150 of postoperative tetany, and 18 patients had cataracts that had been studied. Eleven were operated on. They came in shortly after the thyroid operation and began to speak of a sudden blurring of vision which lasted for a minute the first time and increased in duration until it lasted a half hour. Observation revealed a slight amount of granular deposit on the posterior capsular surface. This increased and, as the spasms increased, these flecks assumed the line of contraction of the lens. It is my assumption that they formed spicules, and as the spicules became more apparent the lens changes became more diffuse and these patients went into complete cataract often in three weeks. In regard to pituitary involvement, as I said at the outset, one cannot isolate one gland. If a patient has hypothyroidism and one looks for changes in the pituitary, one will usually find them. These patients usually have increased dextrose tolerance. If the general condition does not have anything to do with the eye condition, surely treatment would not be of value. However, if they are given thyroid extract or pituitary they get over most of their difficulties. In case of hypothyroidism with pituitary dysfunctioning, with high myopia, these patients have a low basal metabolism, even as low as —51. They have a flat dextrose tolerance curve, and they are definitely helped by thyroid extract over a long period of time. It is also true in cases of keratoconus. Most persons with keratoconus have hypothyroidism, but they may have a change from hyperthyroidism to a hypothyroidism. I am sure the more one sees of these cases the more one will realize that there is something in endocrine disturbance in connection with eye disease.

STAPHYLOCOCCUS FOOD POISONING*

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European writers have generally held the opinion that bacilli of the Salmonella (paratyphoid-enteritidis) group are the common causes of bacterial food poisoning. Savage and White [1] state that the majority of outbreaks in Great Britain and practically all of any importance are due to specific infection or intoxication with bacilli of this group, and White [2] later specifies Bacillus aertrycke as the "cause of the vast majority of outbreaks and cases of acute gastro-enteritis (food poisoning)."

Experience in this country has not shown that paratyphoid bacilli can be connected with outbreaks of food poisoning in nearly as high a proportion as indicated by the foregoing statements. Over a period of several years, material from typical outbreaks of food poisoning has been received from physicians and public health officials and subjected to careful examination in our laboratories. This material has consisted chiefly of food epidemiologically implicated and of stool samples from patients. In many instances the specimens have been fresh and in unexceptionable condition for bacteriologic examination. Although suitable methods, such as Endo medium and eosin-methylene blue (methylthionine chloride, U. S. P.) have been used, a thorough search for organisms of the Salmonella type has in most cases yielded negative results. It does not seem likely that in the United State "nearly nine tenths" of the outbreaks of food poisoning are due to Salmonella, as is thought to be the case in Great Britain.

The discovery of a new type of food poisoning due to the toxic products of staphylococci seems to explain a certain number of outbreaks in which no Salmonella bacilli are found. The following observations may contribute to the recognition of staphylococcus food poisoning and to an appreciation of its importance:

Three outbreaks [3] have already been placed on record. In the first of these,[4] observed in 1914, a staphylococcus of the albus variety was apparently the cause of several attacks of acute gastro-enteritis on a farm in the Philippines. Milk that was inoculated with the strain isolated, and then incubated for about eight hours, caused similar illness when drunk by the experimenter. In the second,[5] yellow staphylococci were found in large numbers in a Christmas cake which had caused the illness of ten persons in Chicago in December, 1929; two different strains, isolated independently by different observers and grown in ordinary nutrient broth for from two to three days, yielded filtrates that produced violent gastro-intestinal symptoms when swallowed in from 2 to 10 cc. amounts by human volunteers. Another outbreak of food poisoning,[6] affecting four persons in a Porto Rican village,

* From the Department of Hygiene and Bacteriology, University of Chicago.

1. Savage, W. G., and White, P. B.: Medical Research Council, Special Report Series number 91, London, His Majesty's Stationery Office, 1925.
2. White, Medical Research Council, System of Bacteriology 4: 127, 1929.
3. Barber, M. A.: Philippine J. Sc. (Trop. Med.) 9: 515, 1914. Dack, G. M.; Cary, W. E.; Woolpert, Oram; and Wiggers, H.: J. Prev. Med. 4: 167 (March) 1930. Jordan, E. O.: The Production by Staphylococci of a Substance Producing Food Poisoning, J. A. M. A. 94: 1648-1650 (May 24) 1930.
4. Barber (footnote 3).
5. Dack (footnote 3).
6. Jordan (footnote 3).

was traced to the eating of cheese; a portion of the suspected food was obtained for me by the kindness of Dr. Costa Mandry, and yellow staphylococci were found in it; filtrates of broth cultures of these organisms, prepared as before described, reproduced the symptoms of food poisoning in three human volunteers. To these may now be added a fourth,[7] caused by chicken gravy eaten by two persons in the Panama Canal Zone. In this instance also, staphylococcus filtrates were obtained which reproduced the typical symptoms in several human volunteers.

Still another instance of staphylococcus food poisoning has been studied in the laboratories of the University of Chicago:

In November, 1930, a portion of a layer cake ("devil's food"), purchased at a store in Milwaukee, was served at the evening meal to four adults. One person did not eat any of the cake and was not ill; the other three partook of the cake and became violently ill with vomiting, diarrhea and abdominal pain. On the following day the mother of one of the patients ate some of the cake and became ill in a few hours with similar symptoms. We were informed that four other persons had become ill after eating cake from the same batch, but we were not able to secure any definite histories. Complaints were received about four cakes. Other cakes belonging to this batch of cakes (twenty-nine in all) were eaten without producing any noticeable ill effects. Portions of two cakes that had presumably caused illness were received at the laboratory and subjected to careful bacteriologic examination by Dr. G. M. Dack. Yellow hemolytic staphylococci were isolated and were present in large numbers (540,000 per gram) in the cake substance; they were also present in the filler, but in smaller numbers. Through the cooperation of Major John R. Hall, M. C., U. S. Army, I was able to test the toxicity of the sterile broth filtrates of this strain on human volunteers. Three adult male volunteers were each given 2 cc. of the untreated filtrate in pasteurized milk; two of the three became ill with typical symptoms. Two others, given 5 cc. in the same manner, were both affected. An experimental cake was inoculated by Dr. Dack with this strain of staphylococcus and portions of the cake and filler (containing living staphylococci as well as their products) were eaten by two volunteers; both became ill.

There are thus four instances in which we have found that food epidemiologically implicated in food poisoning contained staphylococci in large numbers; the staphylococci when isolated in pure cultures have yielded a broth filtrate (two days) which, when swallowed in small amounts (from 2 to 10 cc.) by human volunteers, has reproduced with fidelity the typical symptoms observed in the original patients.

There are also two reported instances in which the drinking of milk inoculated with pure cultures of staphylococci has caused illness. In one of these, the report by Barber in 1914, already cited, the staphylococci were of the albus variety; in the other, recently reported by Ramsey and Tracy,[8] an orange colored staphylococcus, believed to be of the aureus type, was apparently incriminated.

In addition to these six instances of quite well established staphylococcus food poisoning, our files of food poisoning outbreaks have been found to contain several reports in which staphylococci may be regarded with more or less definiteness as the probable inciting agents:

(*a*) In June, 1929, twenty guests at a wedding party in Chicago were seized with violent gastro-intestinal illness soon after partaking of a wedding cake. It was reported to the city health authorities that other cakes distributed by the same baker about this time caused similar illnesses in four or five families. A large piece of the wedding cake, brought to our laboratory, was subjected to bacterial examination (by Miss Dorothy Reiter). No organisms of the paratyphoid group were found (Endo medium), but large numbers of yellow gram-positive staphylococci were present. Monkeys fed with portions of the cake, of the filler and of the staphylococcus culture did not show any signs of illness. No experiments were made with human volunteers.

(*b*) In July, 1929, five firemen in one squad in Chicago became ill with nausea, vomiting, diarrhea and cramps about two to four hours after an evening meal in which canned beef and layer cake were the chief articles of diet. Beef from the same can had been eaten by others who were not ill, but the eating of cakes from the same bakery batch was found to have been followed by twelve cases of illness in one family (two others who did not eat the cake remaining well) and three in another. In the latter instance, cream puffs and not the layer cake had been eaten and, since the same custard filler was used in the two, it seemed probable that the filler contained the active toxic agent. Examination of other samples of cake from the implicated bakery did not bring to light any bacteria of the paratyphoid group (Endo medium), but microscopic examination made in our laboratory showed the presence of gram-positive staphylococci. At the time, the staphylococci were not suspected of connection with the outbreak.[9]

(*c*) In July, 1928, approximately 150 persons in Boston and vicinity became ill with acute gastro-intestinal disturbance in a few hours (mostly from one to three and one-half hours) after a midday lunch in which chocolate cream pie seemed to be the common factor. A report of the outbreak was published later[10] and the epidemiologic evidence there presented seemed to warrant the conclusion that the cream filling of the pie was the cause of the outbreak. A volunteer experimenter in Boston became ill after eating a piece of the pie. Through the courtesy of Dr. George H. Bigelow, commissioner of public health of Massachusetts, specimens of the incriminated food were sent to me. Bacterial examination of the pie and filler did not result in the isolation of any member of the paratyphoid group but showed the presence in the filler of streptococci and staphylococci.[11] At the time, the streptococci were considered of greater interest than the staphylococci, and cultures were made in milk and broth and fed to monkeys in large amounts (150 cc.) without, however, causing any illness in these animals. The staphylococci were not experimented with further. In the light of our later knowledge, they may perhaps have been responsible for this outbreak.

(*d*) In April, 1931, sixteen persons in five families in Jersey City became seriously ill with acute gastro-intestinal symptoms from three to four hours after partaking of layer cake. While individual cakes were served in each family, the cake all came from one bakery and had been baked at the same time and filled from the same batch of filling. A portion of the implicated cake was sent to us through the courtesy of Dr. D. J. Sullivan, deputy health officer. No members of the group of paratyphoid bacilli were found, but large numbers of staphylococci were present in the filler and cake (from 25 million to 30 million per gram).[12] In this instance the epidemiologic observations, the symptoms, the period of incubation and the large numbers of staphylococci found in the incriminated food strongly suggest that this outbreak was due to staphylococci.

Other records in our laboratory reports show that staphylococci were present in food suspected of causing food poisoning, but these instances do not seem worthy of specific mention, since either the epidemiologic evidence implicating the food was inadequate or the staphylococci in the sample examined were too few to establish any significant relation.

Occasionally in the literature one comes across descriptions of outbreaks of food poisoning in which

7. Jordan, E. O., and Hall, J. R.: J. Prev. Med. **5**: 387 (Sept.) 1931.
8. Ramsey, R. J., and Tracy, P. H.: Proc. Soc. Exper. Biol. & Med. **28**: 390 (Jan.) 1931.
9. Dr. W. E. Cary supplied the data in this case.
10. Nelson, N. A.: New England J. Med. **199**: 1145 (Dec. 6) 1928.
11. The laboratory work was done by Mrs. I. J. Kirkman.
12. Laboratory data by Dr. S. A. Koser.

staphylococci have been reported present in large numbers in the incriminated food, whereas no paratyphoid bacilli could be found. The following statement, for example, appears in the 1927-1928 report of C. W. Arthur, the bacteriologist of the Pasadena Health Department Laboratory:

> Two outbreaks of food poisoning occurred, one originating from French vanilla ice cream and one from custard-filled cream puffs. The symptoms in the outbreaks were practically the same: acute nausea and vomiting and diarrhea with spastic abdominal pains, beginning in from three to five hours. When the intestinal tract was cleared, recovery occurred quickly in most instances. In neither food was it possible to demonstrate organisms of the Salmonella group. However, a gram-positive coccus with the same characteristics was present in enormous numbers in and isolated from each food.

Since the publication of our first papers,[13] two outbreaks of food poisoning in New York State have been described,[14] both of which may have been due to staphylococci. In one of these, a cake purchased at a church fair caused violent illness in four members of a family of six, the two persons unaffected having eaten the other articles of food served but not the cake. The incubation period was less than an hour, and the symptoms were similar to those observed with staphylococcus filtrate. Staphylococci were found to be the predominating organisms in the cake and "no organisms of the enteric disease group were isolated." In the other instance an outbreak of gastro-enteritis, estimated at not less than 125 cases, occurred among persons eating cream puffs or chocolate eclairs manufactured and distributed by a wholesale bakery. The onset of symptoms occurred within a few hours after eating. Staphylococci were isolated from the filling, but "none of the organisms generally associated with enteric diseases was isolated from the filling of the pastry or from the feces of patients."

COMMENT

The staphylococcus type of food poisoning differs in several respects from the more familiar type due to members of the Salmonella or paratyphoid group. It could, of course, never be confused with botulism.

There is a distinct difference in the incubation period. Staphylococcus food poisoning usually develops within a few hours after the toxic substance is swallowed. In the outbreaks thus far traced to this source, nearly all the persons affected have manifested symptoms within four hours, although rarely symptoms have appeared later. Human volunteers, of whom we now have a record of approximately 100, almost invariably show the first objective symptoms in from two to four hours after swallowing toxic staphylococcus filtrates. Vomiting appears with considerable regularity about three hours after the feeding.

Salmonella food poisoning, on the other hand, has as a rule a considerably longer incubation period. Although marked individual differences are observed, the onset of symptoms is on the average at least from six to twelve hours after eating the food and is probably somewhat longer. In many authentic instances the Salmonella incubation period is more than twenty hours.[15]

No deaths have yet been observed from food poisoning of the staphylococcus type. In the four outbreaks definitely traced, twenty persons are known to have been acutely ill, without any fatalities. The same is true of the instances reported by Barber and by Ramsey and Tracy, living staphylococci as well as their products being swallowed in these cases. In the four additional outbreaks previously summarized (*a*, *b*, *c* and *d*), in which there is strong evidence that staphylococci were the inciting agents, 206 persons were affected, without a death. Approximately 100 human volunteers who have become ill after swallowing sterile toxic filtrates have all recovered completely. The symptoms are, however, in some cases alarmingly violent and accompanied by great prostration. I do not believe that it can yet be said that this form of food poisoning is without danger to life. The mortality in the Salmonella form of food poisoning is usually estimated at about 1 to 2 per cent.

Perhaps the most important difference yet found between the Staphylococcus and the Salmonella types of food poisoning is that the staphylococci isolated in these cases yield a sterile broth filtrate which reproduces the characteristic symptoms when swallowed in as small amounts as 2 cc., whereas Salmonella filtrates have been fed to human volunteers in as large amounts as 145 cc. without producing any symptoms.[16]

The staphylococci concerned in food poisoning, as far as they have been studied, do not seem to differ in their main cultural characteristics from the common and widely distributed members of this group. Both albus and aureus varieties are found among the strains yielding toxic filtrates. There is evidence that strains that at one time produce the toxic substance do not produce it at another time, and vice versa. The majority of the toxic strains that we have isolated have lost (temporarily?) after some months of cultivation the power of yielding toxic filtrates. In two instances,[6] strains that produced a toxic filtrate early in 1930 soon after isolation (strains 1 and 5 in this paper) still produced, a year later (February-March, 1931), filtrates that caused illness in human volunteers. The potency of the filtrates from these year-old strains was not as great, however, as that of two more recently isolated strains, one from the Milwaukee cake (March, 1930) and one from chicken gravy (March, 1931).

The source of the staphylococcus contamination of food has not yet been determined. In connection with the Milwaukee cake outbreak, we were able to obtain samples of the materials used in preparing the cake: frozen eggs, flour, sugar, cocoa, soda, flavoring compound and "crisco." While abundant bacterial growth occurred from several of these ingredients, staphylococci were not found in large numbers in any. Samples of batter mixed by hand by six different workers in the bakery were also examined without in any instance disclosing staphylococci in noteworthy numbers. There is evidence that staphylococci with food poisoning qualities are sometimes present in cow's milk,[8] but since it has been shown[6] that staphylococci from the apparently normal human throat and other sources are also able to produce a substance that is toxic when swallowed, the derivation of the staphylococci causing any particular outbreak may not be easy to determine. The thorough study of a larger number of outbreaks than yet available will be necessary before the question of origin can be satisfactorily settled.

13. Dack (footnote 3). Jordan (footnote 3).
14. Health News, New York State Dept. of Health, Oct. 13 and Dec. 18, 1930.
15. Sacquépée, E.: Les empoisonnements alimentaires, Paris, J.-B. Baillière & fils, 1909. Savage, W. G.: Food Poisoning and Food Infection, London, Cambridge University Press, 1920. Savage, W. G., and White, Bruce: Medical Research Council, Special Report Series number 92, London, His Majesty's Stationery Office, 1925.
16. Dack, G. M.; Cary, W. E., and Harmon, P. H.: J. Prev. Med. 2: 479 (Nov.) 1928.

The properties of the toxic substance are still under investigation. Progress in this field has been necessarily slow because of the difficulties entailed by having to use human volunteers. Some degree of tolerance appears to develop in man fed with toxic staphylococcus filtrates, but there is no evidence of the generation of any true immune body.[17] Repeated attacks of gastro-intestinal disturbance may be produced in the same individual by successive feedings. The toxic substance is not completely destroyed by boiling for thirty minutes but is perhaps somewhat weakened.[18] Sterile toxic filtrates stored at low temperatures retain their original strength for at least three or four weeks; in one instance, 5 cc. of a 67-day old filtrate produced violent symptoms in a volunteer.[18] The toxic quality of a filtrate is not destroyed by contact with a rather strong chlorine solution (0.1 cc. of 0.0915 per cent chlorine (Cl_2) solution added to 5 cc. of a toxic filtrate three minutes before swallowing).

Clinical Notes, Suggestions, and New Instruments

SUCCESSFUL REMOVAL IN AN ELDERLY PATIENT OF AN ENDOTHELIOMA OF THE SPINAL CORD

MARK GERSTLE, JR., M.D., AND EDMUND J. MORRISSEY, M.D.
SAN FRANCISCO

The features of the case that we are about to describe which in our opinion render it worth while to report are, first of all, the cervical location of the tumor; second, the advanced age of the patient; third, the long duration of the symptoms which were repeatedly misinterpreted, and, finally, the excellent result of the surgical extirpation.

Miss J. E., aged 67, when first seen by one of us (M. G., Jr.), in July, 1929, was confined to bed at her home. Her chief complaints were spastic paralysis of both legs, incontinence of urination and defecation, and spastic weakness and beginning contractures of both hands.

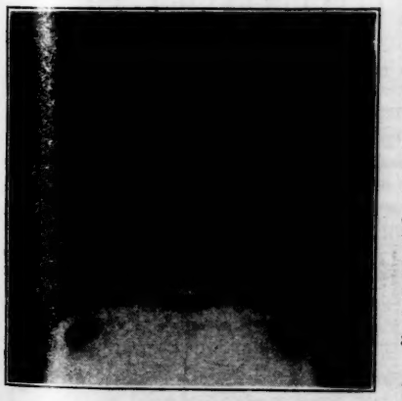

Fig. 1.—Anteroposterior view of iodized oil arrested opposite the fifth cervical vertebra; distinct filling defect.

The family history is inconsequential. The patient's health before the onset of the present illness had always been excellent. She had lived in California most of her life, where she used to be a school teacher.

June 9, 1923, the patient presented herself at a well known clinic complaining of weakness and occasional loss of control of her right ankle and leg. Following several examinations at the clinic she was advised to enter the hospital for observation, which she did, June 23, 1923. She remained there four days and remembers that among other procedures a lumbar puncture was performed. She then returned to the clinic, where some medicine was prescribed for her. A few days later she had "eruptions in the form of water blisters" across the back. Shortly afterward she discontinued her visits to the clinic and employed a chiropractor, who treated her with ultraviolet rays and massage without benefit. In 1924 she paid monthly visits to a physician, who stated that her symptoms were due to "high blood pressure." In 1925, the weakness of her right leg had grown much worse and she then began to notice a similar loss of power in the left lower extremity. She also began to be troubled with paresthesias in both limbs which she describes as "hot, creeping sensations" and "ice-like feelings" chiefly in the soles of both feet. Then followed a long period of attempted treatment by a second physician and also by a member of the orthopedic staff of the San Francisco clinic, which she had previously attended. On the advice of the orthopedist, September 13, she again entered the hospital, where she remained six days. At this time roentgenograms of her spine were taken, following which she was discharged unimproved.

In 1926 she entered the hospital, where her legs, teeth and spine were once more roentgenographed and where she was given massage and electrotherapy. She returned home greatly discouraged, but in the same year she returned for a tonsillectomy, which she had been strongly recommended to have performed. The second night after her return home she noticed for the first time she had completely lost control of her left leg. Thereafter she was confined to her bed except for brief periods spent in a wheel chair. A diagnosis of arthritis was made with a poor prognosis.

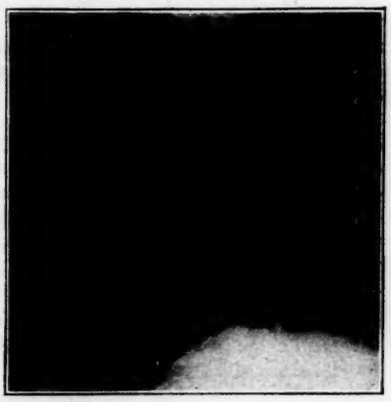

Fig. 2.—Lateral view of the phenomenon illustrated in figure 1.

In 1927 she noticed that the little finger of the right hand became "separated from the other fingers." She soon became unable to grasp anything with this hand, and a few weeks later the left hand suddenly became "useless." Both hands became "ice cold" and remained so. She began to have involuntary micturition and defecation. During the latter part of 1927 and the early months of 1928 the symptoms in her hands gradually increased and she became absolutely confined to her bed and was unable to sit up unless heavily supported. She also began to notice a feeling of "painful pressure" between her shoulder blades.

In July, 1929, the patient was visited by one of us (M. G., Jr.). At this time she presented the picture of a spastic paraplegia. An atrophy of the small muscles of both hands was noticed. Her general nutrition was excellent, however, although the patient was completely incapacitated and bedridden. On this occasion a tentative diagnosis of spinal cord tumor was made and the patient was hospitalized for further investigation. August 12, the patient was transported to the French Hospital in San Francisco by an ambulance, where the first systematic examination was made. The essential observations were:

1. Atrophy and spastic weakness of the thenar and hypothenar muscles, more noticeable in the right hand than in the left.

2. Complete spastic paralysis below the waist. The tonus of both legs was greatly increased. The patient was unable to move her lower limbs or feet in any way. The abdominal reflexes were absent. The knee and ankle jerks were very hyperactive. There was a well sustained bilateral ankle clonus and a positive Babinski response in both feet. During the examination the patient passed feces and urine involuntarily. There was a moderate amount of generalized atrophy of the muscles of both thighs and legs, but no more than would inevitably occur from almost three years of disuse. The sensory examination disclosed a hypesthesia and hypalgesia extending to a level approximating the first dorsal segment. This was somewhat patchy and difficult to demarcate. Deep joint and vibratory sensibilities were completely absent in the lower extremities.

Despite the patient's excellent nutrition the possibility of a metastatic cord tumor was considered, but flat plates of the

17. Dack, G. M.; Jordan, E. O., and Woolpert, Oram: J. Prev. Med. 5: 151 (March) 1931.
18. Jordan, E. O., and Dack, G. M.: J. Prev. Med. 5: 383 (Sept.) 1931.

femurs, pelvis and rib-cage revealed no evidence of a malignant growth. However, these roentgenograms showed a rather advanced hypertrophic arthritis of the knees and lumbodorsal spine.

A spinal puncture was then performed. The fluid was clear and colorless, the pressure 6 mm. of mercury (normal). The Queckenstedt test was definitely positive, there being absolutely no rise in pressure on bilateral compression of the jugular veins. The cell count was 6 lymphocytes, the Pandy test was positive, and the total protein was 160 mg. per hundred cubic centimeters. These observations strongly pointed to a subarachnoid block, probably the result of tumor. Accordingly, the clinical observations were confirmed and the level was estimated to be about the first dorsal segment.

Two days later a cisternal puncture was done, 1 cc. of fluid removed and 1 cc. of warm iodized poppy-seed oil slowly injected. The patient was held in the sitting position and fluoroscopy was performed by Dr. L. B. Crow, the iodized oil descending to a level opposite the upper border of the fifth cervical vertebra, where it stopped, showing a distinct filling defect. Plates taken one hour and twenty-four hours later revealed the same evidences of block.

The diagnosis of a cord tumor was accordingly concurred in by the neurologist, neurosurgeon and roentgenologist. The lack of painful symptoms was in favor of an intramedullary growth and this point leading, of course, to a bad prognosis was carefully explained to the patient. She, however, decided to be operated on, despite the fact that no great hope of alleviation or cure could be offered her.

August 19, one of us (E. M.) under local infiltration with procaine hydrochloride performed a laminectomy on the patient. After removal of the laminae of the fifth, sixth and seventh cervical vertebrae and opening of the dura, an endothelioma which lay between the meninges was removed. This tumor weighed 2.5 Gm. and had compressed the right side of the cord, thereby reducing its caliber to about one-third its normal size. The dissection of the tumor was complicated toward the end by the necessary pulling on the posterior roots, which caused the patient considerable pain. It was, however, completely removed and the patient returned to her room in excellent condition.

Within half an hour after the operation had been completed, the patient noticed that she was able to flex her left ankle slightly and move the toes of her left foot. Within twenty-four hours she began to regain the use of her left hand. Within a week, flexion, extension, adduction and abduction of the left leg and thigh were performed and about this time she began to recover the ability to bend and extend the toes of her right foot. The patient remained in the hospital for three weeks, owing to a small sinus in the wound. On her discharge she was able to control her hands perfectly, bend and extend her left leg and flex her right leg.

From that time to the present her improvement has gradually increased. In November, 1929, a letter was received from the patient in which she stated that she was able to use her hands as well as ever in her life, she was able to sit up unsupported, and she could swing her legs from one side of the bed to the other so that she could get in and out of a wheel chair unsupported. The control of her sphincters had almost completely returned and she expected to attempt the use of crutches in the near future. The atrophic muscles of her hands had noticeably filled out and their power was excellent.

In March, 1931, the patient was last seen and examined. Her improvement had been very marked. She was able to walk around her house and garden without the use of crutches or any other support. Her general health was excellent. She had regained control of her sphincters, and her only complaints were occasional burning, prickling sensations in the right foot and in the region of the right knee.

The physical examination at this time showed that the right ankle and knee jerks were still very hyperactive and that the Babinski reflex on the same side was positive. The ankle clonus, however, had disappeared. The power in both lower extremities was excellent and there were no noticeable sensory changes.

COMMENT

This case illustrates the advantages of cooperation between clinician, surgeon and roentgenologist. All three individuals contributed in an essential way to the favorable outcome. It also illustrates the lack of careful examinations and useless therapy to which such patients are often subjected. It appears to us that the favorable result is remarkable owing to the rather advanced age of the patient, the cervical location of the tumor and the long duration of the symptoms.

490 Post Street—909 Hyde Street.

HYPERINSULINISM: REPORT OF A CASE

HENRY J. JOHN, M.D., CLEVELAND

Jan. 24, 1929, a physician, aged 61, came to the Cleveland Clinic with a history of diabetes. His weight had decreased from 230 pounds to 137 pounds (104 to 62 Kg.), a loss of 41 per cent. He was 5 feet 8½ inches (174 cm.) in height. He gave the following history:

After an attack of influenza a month previous to entering the clinic, he lost weight rapidly and became very weak. He was exceedingly nervous and a tremor was present. Nocturia and glycosuria developed. He took some medicine by mouth but kept on losing weight and strength, and jaundice developed. The previous history contained nothing of importance.

On physical examination the patient was found to be extremely weak and emaciated. The teeth and tonsils were infected. The chest was clear, but a pulmonic systolic murmur was present. The liver was enlarged. The blood pressure was 136 systolic and 70 diastolic, the pulse 108 and the temperature 99.2 F. The basal metabolic rate was plus 83 per cent. Roentgen examination of the gallbladder revealed shadows suggestive of stones. Roentgen examination of the gastro-intestinal tract gave negative results.

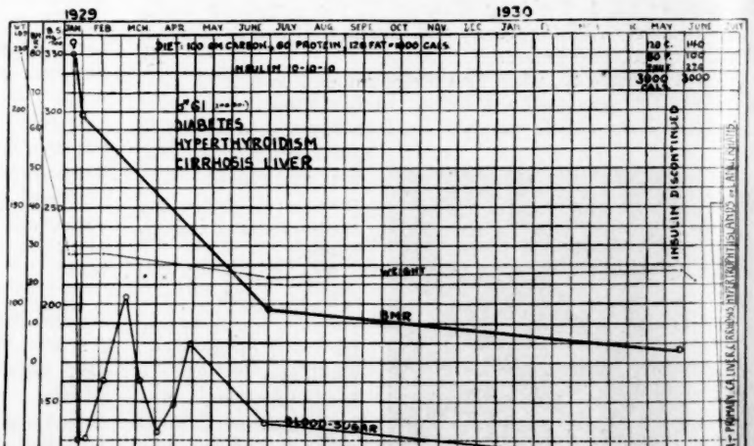

Fig. 1.—Clinical conditions in a patient presenting hyperthyroidism and diabetes, with hyperinsulinism.

The diagnosis included hyperthyroidism, diabetes mellitus, septic teeth and tonsils, and hypertrophic cirrhosis of the liver.

The patient entered the hospital and was put on routine diabetic treatment and compound solution of iodine (Lugol's solution) 15 minims (0.9 cc.) three times a day. The infected teeth were extracted. Marked improvement was noted; the blood sugar dropped to a normal level, where it remained. The patient was putting out about 4 Gm. of sugar in twenty-four hours during his stay in the hospital. The nervousness and

tremor decreased and in less than five months the basal metabolic rate dropped to plus 13 per cent. The patient's weight, however, did not increase, and he suffered from diarrhea. He went to Florida for a few months and on his return in May, 1930, he was free from sugar. The basal metabolic rate at that time was plus 3 per cent (fig. 1).

Insulin was discontinued, and the patient's diet was increased from 1,800 to 3,000 calories. Examination at this time showed a normal blood sugar and sugar free urine. The carbohydrate content of the diet was now increased to 140 Gm. and the protein content to 100 Gm., the total number of calories remaining the same. The patient did not gain in weight and the diarrhea persisted. He reentered the hospital, July 19, 1930, in coma. The temperature was 100.4 F., the pulse rate 156, and the respiratory rate 24. The blood sugar content was 30 mg. per hundred cubic centimeters. Dextrose was administered intravenously, but the patient died in a few hours.

The observations from the postmortem examination were as follows: hyperplastic lymphoid tissue (lymph nodes, spleen); chronic fibrotic myocarditis; atrophic cirrhosis of liver (hyperplastic bile ducts); thrombosis of splenic and portal veins; primary carcinoma of the liver and secondary carcinoma of the gallbladder; infarcts of lungs; chronic interstitial pancreatitis, with atrophy and hypertrophy of the islands; acute bronchitis and bronchopneumonia; gastro-intestinal hemorrhages; Bacillus coli abscesses in the spleen; arteriosclerosis, and jaundice.

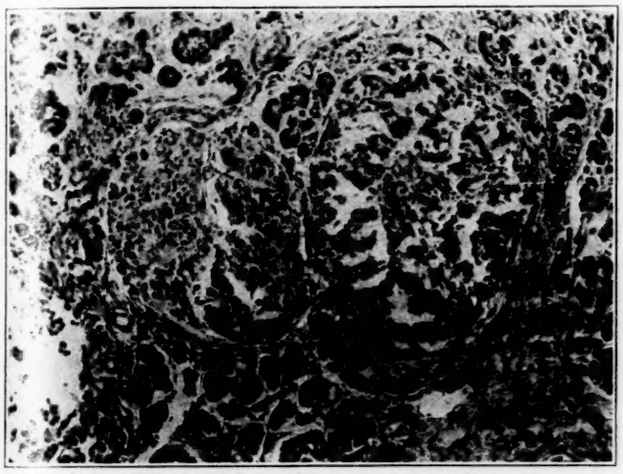

Fig. 2.—Hypertrophic condition of the islands of Langerhans.

Figure 1 shows several interesting points in connection with this case. The severe hyperthyroidism and diabetes responded to treatment with compound solution of iodine and insulin so that, after sixteen months, insulin was discontinued and a normal blood sugar level was maintained even on a markedly increased diet. The emaciation and diarrhea, however, persisted in spite of treatment. The low blood sugar level at the time the patient was readmitted to the hospital in coma would have been difficult to explain but for the postmortem examination.

Figure 2 shows the markedly hypertrophied islands of Langerhans. Such islands produce more insulin than normal islands in spite of the tremendous reserve in normal islands. The question arises, Is it the hypertrophy of the islands per se which causes hyperinsulinism or is it the regulating mechanism of the insulogenic output which brings it about, either in the presence of hypertrophy of the islands or when the islands are normal? Hyperinsulinism is seen in both instances.

2050 East Ninety-Third Street.

Purpura Hemorrhagica Associated with Tuberculosis.—Purpura hemorrhagica is a condition associated with marked diminution in the blood platelets, spontaneous bleeding from the mucous membranes and purpuric lesions of the skin. It may occur in a primary or idiopathic form (called essential thrombopenia), or as a secondary manifestation in pernicious anemia, lymphatic leukemia, diphtheria and tuberculosis.—Litvak, A. M., and Holzsager, T. G.: Purpura Hemorrhagica, *Am. J. Dis. Child.* **42**:1160 (Nov.) 1931.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

AMERICAN BAKERS ASSOCIATION ADVERTISING CAMPAIGN

Sponsors.—American Institute of Baking, Chicago.

The following statements in promotion of "white bread" have been accepted and may be used in advertising in conjunction with the seal of the committee in accordance with the Rules and Regulations:

White bread is a wholesome, nutritious food. As such, it has its rightful place in the normal diet of the normal individual. Its avoidance for fear of any untoward nutritional consequences or the fear that it is the cause of any disease condition when properly used in the normal diet is without scientific foundation.

PABST PASTEURIZED PROCESS CHEESE (PIMENTO)

Manufacturer.—Pabst Corporation, Milwaukee.

Description.—A pasteurized process American cheese containing disodium and trisodium phosphates as emulsifiers, with pimentos and salt.

Manufacture.—The manufacture is essentially the same as that described for Pabst-ett (A Pleasing Combination of "Process" Cheese, Milk Proteins, Milk Sugar, Milk Minerals) (THE JOURNAL, Oct. 24, 1931, p. 1227) excepting that canned pimentos are added but no whole milk or concentrated milk whey.

Chemical Composition (submitted by manufacturer).—

	(sample as is) per cent	(moisture free basis) per cent
Moisture	39.9	...
Ash	5.0	8.3
Salt in ash	1.6	2.7
Fat (ether extract)	30.4	50.6
Protein (N × 6.38)	22.6	37.6
Lactose (by difference)	2.1	3.5
Phosphorus (P)	0.35	0.58

Calories.—3.72 per gram; 105.6 per ounce.

Vitamins.—The vitamin content is essentially that of Pabst-ett (A Pleasing Combination of "Process" Cheese, Milk Proteins, Milk Sugar, Milk Minerals).

Claims of Manufacturer.—See this section for "Pabst-ett."

PIXIE STRAINED TOMATOES

(Mildly seasoned with salt)

Manufacturer.—Fruit Belt Preserving Company, East Williamson, N. Y.

Description.—Canned, sieved tomatoes containing in large measure the mineral and vitamin content of the raw tomatoes used; contains a small amount of added salt.

Manufacture.—Mature tomatoes are sorted and washed, and green sections, cores and defective spots are trimmed out by hand and again washed. The prepared tomatoes are broken down by steam in a closed kettle and then sieved, canned and processed by essentially the same method as those described for Strained Carrots (THE JOURNAL, Nov. 14, 1931, p. 1467). The final processing involves twenty minutes' heating in boiling water. A small amount of salt is added to each can.

Chemical Composition (submitted by manufacturer).—

Specific gravity 20 C./20 C.	1.06
	per cent
Moisture	88.8
Total solids	11.2
Ash	1.2
Fat (ether extract)	0.1
Protein (N × 6.25)	1.9
Carbohydrates other than crude fiber (by difference)	7.4

Calories.—0.38 per gram; 10.8 per ounce.

Vitamins; Micro-Organisms; Claims of Manufacturer.—See these sections for Pixie Strained Carrots.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 5, 1931

FEE SPLITTING—AN OLD ETHICAL PROBLEM

A basic principle in medical practice demands that the physician call as a consultant the best available man for the purpose. That principle is determined, of course, by a fundamental consideration: the one impelling motive in every action taken by a physician must be the good of his patient. For these primary reasons, ethical physicians oppose fee splitting in any way, shape, manner or form. Every one now realizes that the general practitioner who makes the diagnosis and who is primarily responsible for the care of the patient deserves a much greater percentage of what the patient is able to pay than he actually gets when the patient is referred to a surgical, otolaryngologic, ophthalmologic or other consultant. Nevertheless, if this is accomplished by the secret division of fees it is an abomination full of evils. If patients could come to understand that the general practitioner's fee, when a specialistic procedure is necessary, should be greater than on ordinary occasions, the difficulty would be largely overcome.

Still more hazardous to the patient and to the honesty of the medical profession are the inroads on the traditional ideals of medicine brought about by the entrance into the medical field of innumerable technical procedures. The changing nature of medical practice means that medicine is now conducted not only by the 150,000 physicians who practice in our country but also by several hundred thousand nurses, laboratory technicians, nonmedical roentgenologists, anesthetists, dietitians, physical therapy aides and similar groups. These workers do not have the background conferred by scientific medicine. To them in many instances "ethics" is merely a word. Moreover, technical services are being purveyed by corporations sometimes controlled by business men who are not physicians, sometimes by physicians who are primarily business men. In various parts of the country, physicians are being urged to arrange for laboratory service, for x-ray service, for physical therapy help, for colonic flushing, and for dietetic service with corporations, institutions, laboratories or technicians who are willing, provided the physician sends his patients to them, to give to the physician a portion of the income derived from such clientele. If it is essentially unethical for a physician to choose, as a surgeon for his patient, the operator who will give him the largest percentage of the fee rather than the one who would seem to be the best available surgeon for the purpose, it is equally wrong for him to select any other service to be given to the patient on the same basis. With this point of view there cannot be any argument. The essential dishonesty cannot be evaded by any form of charter, contract, mutual agreement or similar arrangement.

The nature of the times is such that men driven by economic necessity seek to find plausible apology for evasions of ideals and principles that in more liberal times they would support without the slightest hesitation. Manufacturers whose competitors give them little concern in times of prosperity burn with indignation at the slightest hint of unfair competition during times of economic depression. The traditions and ideals of scientific medicine have weathered many an economic storm during the two thousand years that they have guided the noblest of professions. It is reasonable to believe that the tottering of a few during this time of stress will not become the example that will lead the rest of the profession to follow the black sheep blindly over the precipice.

MORE ABOUT THE MENACE OF METHYL ALCOHOL

The comparative toxicity of methyl alcohol, or methanol as it is now frequently designated, has been known for many years. Soon after the middle of the nineteenth century it was clearly established that "methylated spirits," or wood alcohol, represented a serious hazard in certain industrial processes. For some time the exceptionally poisonous properties were attributed to impurities in the commonly used methanol, wood alcohol. Improvements in the processes of its production led to removal of offensive odors and other purification resulting in increased sale for a variety of purposes. The dangers were not lessened. Then several factors came to the fore in bringing about greater danger from methyl alcohol. The prohibition of the sale of alcoholic beverages led to the substitution of methyl alcohol for the forbidden grain spirit, ethyl alcohol, frequently on the unwitting assumption that these chemical compounds so similar in many properties were practically interchangeable from a physiologic standpoint. Impure methyl alcohol began to be used as a denaturant of ethyl alcohol, to permit the latter to be employed for technical purposes and yet make it unfit for human consumption. This led to numerous fatalities through the drinking of "industrial alcohol" containing methyl alcohol or products distilled from it. Further-

more, the growing number of automobiles has led to widespread use of methyl alcohol as an antifreezing agent in radiators of motor cars. Fumes of the heated alcohol rarely might be inhaled to an extent that brings disaster. Finally, the employment of methyl alcohol as a solvent has introduced additional hazards when the products are applied in enclosed spaces.

In their monograph on noxious gases, Henderson and Haggard [1] have pointed out that the solubility of the alcohols causes them to be eliminated only slowly through the lungs. The slow elimination is, however, in part counterbalanced by the oxidation of some of the alcohols within the body. This destruction of alcohol in the body is particularly marked for ethyl alcohol but does not occur to more than a small extent with methyl alcohol. Ethyl alcohol is more toxic than methyl for equal concentrations maintained in the body, but the rapid oxidation of ethyl alcohol to water and carbon dioxide prevents its acting as a serious toxic agent when it is absorbed through the lungs from any ordinary concentration of its vapor in air. On the other hand the vapor of pure methyl alcohol is an anesthetic, a nonreactive gas of high solubility, which therefore accumulates in the body and exerts a direct poisonous action on the nervous system, particularly the retina. According to Henderson and Haggard, more than a week is required to eliminate the methyl alcohol acquired by a single large absorption. If the exposure is repeated before the elimination is completed, a cumulative effect results; the amount absorbed at each exposure is added to that which remains uneliminated. A toxic concentration is thus gradually built up in the blood as a result of exposure to concentrations that do not cause an appreciable effect on a single exposure.

The salient facts just reviewed have been presented repeatedly in THE JOURNAL. In addition to the deliberate or the unsuspected imbibition of the harmful methyl alcohol there are the dangers not only of inhalation of its vapors but also of its possible absorption through the skin. Various industries and "filling stations" are particularly involved. It is reported that more than two hundred deaths occurred during the winter of 1930-1931 as a result of unintelligence and free access to methyl alcohol in filling stations and other little controlled sources. These circumstances raise questions of public safety beyond the peculiar present-day incentives to the menacing use of methyl alcohol for beverage purposes.

A recent investigator [2] has pointed out that the participants in the discussion of the toxicity of methyl alcohol are divided into two major groups. One group maintains that the reasonable and intelligent use of methyl alcohol in industry and commerce is safe and practical and may be expected to be attended by no harm to those persons handling it. The other group maintains that reason and intelligence may not be expected from those who are exposed to or have free access to methyl alcohol. In studies on animals at the Industrial Health Conservancy Laboratories in Cincinnati, McCord [2] has found that methyl alcohol applied to the skin has invariably led to damage consistently like that arising from the oral intake of this substance. This evidence of absorbability of methyl alcohol has been noted in optic atrophy observed clinically by ophthalmologists, and after death as observed in lipoidal degeneration. The regular recovery of methyl alcohol on the distillation of all organs derived from skin-treated animals, and the absence of similar conditions in control animals, constitute inescapable proof of absorbability.

How great may the actual danger become? According to McCord, if the results obtained from monkeys may be applied to man, approximately 1 ounce (30 cc.) of methyl alcohol repeatedly in contact with the human body, under conditions favorable to retention and evaporation, constitutes a threat to well being. The threshold of danger by inhalation is well below 1,000 parts per million of methyl alcohol vapor. If this degree of toxicity obtained from monkeys applies to man, the vapors from one ounce of methyl alcohol entering the human body constitute a threat to life even when the exposure is distributed over two or three days. Perhaps the time has come to reappraise the situation that confronts us in the United States and decide whether it calls for further protective measures for the safety of the public. This is particularly true when elaborate studies have led the investigator to regard it as reasonable to assume that "practical hazards for human beings may be produced under conditions of apparently trivial exposures."

1. Henderson, Yandell; and Haggard, H. W.: Noxious Gases and the Principles of Respiration Influencing Their Action, New York, Chemical Catalog Company, 1927.
2. McCord, C. P.: Toxicity of Methyl Alcohol (Methanol) Following Skin Absorption and Inhalation, Indust. & Engin. Chem. **23**: 931 (Aug.) 1931.

EXPERIMENTAL POLIOMYELITIS

Years ago, Lee [1] pointed out that bacteriologists have shown great ingenuity in devising methods by which micro-organisms may be cultivated and studied. He recalled how their laboratories have become veritable bacteriologic gardens, where living germs are kept under the best possible conditions. The species are separated from one another; the proper foods are given to each; the most advantageous surroundings as to light, air, temperature and moisture are provided; the bacteria are nursed when ill, and every effort is made that they may lead healthy lives. Opportunities are thus given for the exact study of their activities. These are, of course, important features in the warfare on disease, and they represent an almost indispensable part of the attack in the field of infectious disorders. In response to microbiotic invasion, the body develops unique methods of defense. In part they are cellular, in part chemical. Antibodies of surprising potency may

1. Lee, F. S.: Scientific Features of Modern Medicine, New York, Columbia University Press, 1911.

result. Specific serums have thus become of life-saving value both as curative and as preventive agents. Problems of immunity are being opened for solution.

In the course of the study of contagion and infectious diseases, investigators have come to appreciate the importance of discovering susceptible experimental animals. It is not enough to isolate the harmful microorganisms or to separate the more elusive filtrable viruses. The response of the body to their presence—the results of their invasion into the fluids and tissues—forms a significant part of the picture of the resultant disease. All the features should be reproducible in their entirety in order to facilitate the study of etiology and treatment. Different species of animals show quite unlike susceptibilities to some of the human ailments. The initiation of progress in combating them is in no small measure made possible, therefore, by finding susceptible animals for the study of the manifestations on the one hand, and for the production of immune serums on the other. Medical history affords illustrations alike of the help afforded by the discovery of suitable animals, such as the horse, in the development of antidiphtheritic substances, and of the retardation of scientific advancement in other instances owing to the inability to imitate specific disorders with certainty outside man.

This has to some extent been true of the dreaded poliomyelitis. The monkey was early found to show some susceptibility. Heretofore it has appeared that only a portion of the human strains of the virus can be implanted in the experimental animals. Flexner [2] has pointed out that, not infrequently after the first successful inoculation of monkeys with human spinal cord or medulla obtained in fatal cases of poliomyelitis, the succeeding inoculation of the spinal cord of the affected monkey has failed to induce disease. The reason for this disparity is not known. Newly announced investigations [2] at the Rockefeller Institute for Medical Research, New York, indicate a way to increase the proportion of successful inoculations of affected human and monkey spinal cords and brain stems. It consists of repetition of the injections of the virus-bearing tissues. According to Flexner, the abortive can be converted into the progressive paralytic disease by means of reinoculation. Whether the acceleration is due to virus alone or to alien tissue elements remains uncertain. It may be merely a summation of virus effects. The immediate feature of moment is the improvement in research technic, for the numerous experimental failures can now presumably be turned into a liberal quota of successes. The 1931 epidemic of poliomyelitis has sufficed to impress the public as well as the physician with the need of persistent investigation. For such studies in poliomyelitis an improved tool of research now seems to have been devised.

2. Flexner, Simon: Accelerated Infection in Experimental Poliomyelitis, Science **74**: 520 (Nov. 20) 1931.

THE PROBLEM OF VITAMIN ASSAY

Any one who has had occasion to deal in any thorough way with the modern problems presented by the discovery of the vitamins must realize the difficulties that attend the quantitative aspects of the subject. It has become obviously important to secure estimates of the varying content of vitamins in the numerous foods that carry these indispensable nutritional substances. The need of suitable methods of assay has been further accentuated along with the growing efforts to separate the different vitamins from their natural carriers and to prepare concentrates that shall be far richer in the food factors than are the natural products. The questions of comparative potency arise in relation to the influence of the varied processing and culinary procedures that foods may be subjected to in the home as well as in the factory. Wherever food conservation is involved, the possibility of deterioration is presented; and this applies to the essential vitamins as well as to the energy-yielding nutrients. A good illustration is afforded by cod liver oil. The value of this widely used medicinal food lies above all in its richness in vitamins A and D. On this account the Council on Pharmacy and Chemistry of the American Medical Association requires that the specific vitamin potency of brands of cod liver oil and cod liver oil concentrates accepted for inclusion in New and Nonofficial Remedies shall be declared on the label and in the advertising of such products.

Unfortunately, assay procedures have been attended with great difficulties. So long as the chemical identity of a vitamin remains undetermined, a statement of potency depends on reference to some reasonably stable and readily obtainable product that shows little variability with respect to the factor in question. Such well defined products have been difficult to secure. On this account the determination of potency has tended in recent years to be based on the physiologic response of a test animal to a given intake or dose of the product to be assayed. This is illustrated in the first standard procedure, for cod liver oil, to be introduced into the U. S. Pharmacopeia X—a method for measuring the content of vitamin A. It consists in ascertaining how much of the oil is required to induce growth at a selected rate of gain in body weight when the substance to be tested is added to a vitamin A free ration of defined character. Experience has shown many pitfalls and opportunities for error. The species of animal, the preliminary depletion of the test animal with respect to vitamin A, and other factors are liable to modify what is in essence a "curative" test. The details of the difficulties need not be rehearsed here. Some workers have preferred to deal with "preventive" tests whereby the quantities required to avert symptoms of avitaminosis are ascertained.

The establishment of units has been confronted with even greater difficulties. The intricacy of the subject

is apparent in consideration of assays of vitamin D. Shall the criterion be growth, the mineral content of the bones, or some other symptom? And when the antiscorbutic vitamin C is brought into the fold it is found that the rat—the conventional test animal for vitamins A, B, D and G—cannot be used because it is not susceptible to lack of the factor under consideration.

The difficulties have multiplied, and the opinions as to procedure have varied to such an extent that some concerted action seems imperative if chaos is to be averted. In the case of immune serums and likewise in the assay of insulin, tenable understandings have been reached, so that a statement of the number of "units" employed is understood the world over. Recognizing the need of a cooperative spirit and undertaking, the American Drug Manufacturers' Association established a vitamin assay committee. Its report has been presented by A. D. Holmes.[1] A conference has also been called in connection with the revision of the U. S. Pharmacopeia and a representative committee has been appointed to deal with the technical problems and terms of vitamin assay, for inclusion of revised standards in the new volume XI. The official character of this book and its semilegal status lend great importance to the deliberations of the group.

Meanwhile the Permanent Standards Commission of the Health Organization of the League of Nations has been concerned with the problem of vitamin standards and units. In the deliberations in London during June, 1931, the United States was represented by Harry Steenbock of the University of Wisconsin and E. V. McCollum of Johns Hopkins University. The London conference [2] has agreed unanimously in favor of defining vitamin units in terms of standard substances rather than in terms of a biologic test. This means that the methods of assay were not considered in detail. It was decided that "when the value in units of a test substance is to be estimated, the test substance and the standard preparation are investigated simultaneously by the same method, and the test substance should therefore show the same value in terms of the standard, whatever biologic technic is employed." The standards thus far selected are as follows: for vitamin A, one international unit is the potency of 1 γ (=0.001 mg.) of pure carotene, which is converted into vitamin A in the body; for the antineuritic vitamin B, 10 mg. of a special adsorption product prepared by Seidell's method from rice polishings; for the antiscorbutic vitamin C, the activity of 0.1 cc. of fresh juice of the lemon, Citrus limonum; for the antirachitic vitamin D, the activity of 1 mg. of the international standard solution of irradiated ergosterol (viosterol), issued from the National Institute of Medical Research in Hampstead.

Some of the advantages of the plan outlined are obvious. All "units" will represent international standards referable to chemical substances that are to be made available to laboratories throughout the world. The establishment of products of fairly well defined character for vitamin assays will be welcomed. It will not do away with the necessity of biologic testing; the behavior or response of the test animal will continue to be a dominant factor in the assay process. There still remains that variability inherent in all such methods of research. Other objections will also doubtless be raised. It remains to be seen whether the American committees will agree to adopt the proposed schemes in their entirety. Of course, the ideal procedure would be a chemical analysis comparable to that by which many drugs can be examined. This eventuality may not be far away. The isolation of vitamin D or its equivalent in a state of crystalline purity has only recently been announced.[3] In any event there are signs of progress ahead.

1. Holmes, A. D.: J. Am. Pharm. A. **20**: 588 (June) 1931.
2. The detailed report has been published in the British Medical Journal, Nov. 7, 1931, p. 862.

Current Comment

THE SUGAR IN NEPHRITIC URINE

There are numerous phenomena in physiology and pathology that are observed so frequently and intimately that their nature is taken for granted. On careful consideration, however, many such manifestations raise more questions than can be answered with any real assurance of accuracy. For example, it might properly be assumed that our knowledge of the functions of the gallbladder would be fairly complete after the many years during which this organ has obtruded itself to the attention of clinicians and physiologists. Some of the shortcomings of current information on this topic were recently referred to in THE JOURNAL.[1] Much the same sort of criticism might be applied to our knowledge of vomiting [2]—a phenomenon of daily occurrence in the bedside experience of the physician. Sometimes a critical student is led to amazement at the paucity of fundamental facts that enter into medical problems. It was known for a long time that there was some kind of "sugar" in the blood. Its actual identification as dextrose is barely older than the century. The familiar sugar of the urine was early recognized as dextrose, but presently came the demonstration that lactose may at times find its way through the kidneys. Subsequently it was learned that "normal" urine carries traces of "reducing substances" and that these are only in part fermentable as dextrose is. What they actually are remains to be learned. The story of urine carbohydrates is not yet a closed book. A significant chapter has recently been added by Hiller [3] from the Hospital of the Rockefeller Institute for Medical Research, New York. It had been known for some time that fermentable reducing substances

3. Crystalline Vitamin D, editorial, J. A. M. A. **97**: 1628 (Nov. 28) 1931.
1. Gallbladder Function, editorial, J. A. M. A. **97**: 105 (July 11) 1931.
2. The Vomiting of Peritonitis, editorial, J. A. M. A. **97**: 181 (July 18) 1931.
3. Hiller, Alma: Identification of Reducing Substances in Nephritic Urine, J. Biol. Chem. **91**: 735 (May) 1931.

were frequently increased in all types of nephritis and that in some of the degenerative cases the excretion amounted to gross melituria.[4] Hiller has now clearly identified the presence of dextrose (by distinction from levulose, mannose, lactose or maltose) in the renal excretion of such patients.

AMERICAN FOUNDATIONS

The general impression prevails that vast sums of money are distributed by various foundations for the public welfare, but thus far little accurate information has been available as to just how much money is distributed and the uses to which it is put. In order to answer this question, the board of trustees of the Twentieth Century Foundation has canvassed the situation and made available a report on American foundations and their fields, covering distributions up to the end of 1930. The definition used indicates that a foundation must be a separate organization with its own board of trustees or directors set up to disburse money not only in operating its own activities but in particular by making direct grants to outside beneficiaries. Religious foundations are not included in the present survey. Apparently the foundations make grants to almost every phase of human activity. One hundred and twenty-two are included in the compilation. The capital funds involved amount to $853,450,114. Since seventeen foundations did not make available the facts, an estimate of approximately $1,000,000,000 seems reasonable. The largest foundations include the Carnegie Corporation with $160,000,000, the Rockefeller Foundation with almost $150,000,000, and the General Education Board with almost $94,000,000. Out of the total of $950,000,000 for all the foundations, 20 of the 122 comprise $725,559,829, or 85 per cent of the total. Grants paid during the year amounted to $52,476,137. The field of medicine and public health was most popular, receiving $18,627,222, or more than one third of all of the funds given away. General education came next. An analysis of the manner of distribution of funds for medicine and health reveals the entrance of the foundations into almost every aspect of medical care.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 11:15 a. m. on Saturday over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week is as follows:

December 12. Cold Facts About Colds.

Five Minute Health Talks may be heard over Station WBBM of the Columbia Broadcasting System at 2:25 p. m. on Monday, Wednesday and Friday.

The program for the week is as follows:

December 7. Dandruff, Dandruff Everywhere.
December 9. New Hazards for Old.
December 11. The Healthy Mind.

4. Hawkins, J. A.; Mackay, E. M., and Van Slyke, D. D.: J. Clin. Investigation 8: 107 (Dec.) 1929.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

GEORGIA

Dr. Hoke Appointed Surgeon at Warm Springs.—Dr. Michael Hoke of Atlanta has been appointed surgeon-in-chief of the Georgia Warm Springs Foundation, effective December 1. He succeeds Dr. Leroy W. Hubbard, chief surgeon since 1926, who, according to the report, will do extension work for the foundation. Dr. Hubbard will make trips to areas of epidemics, consult with state, county and city commissioners of health, and advise with hospitals in regard to medical treatment.

Health at Atlanta.—Telegraphic reports to the U. S. Department of Commerce from eighty-two cities with a total population of 36 million, for the week ended November 21, indicate that the highest mortality rate (19) appears for Atlanta, and the rate for the group of cities as a whole, 11.1. The mortality rate for Atlanta for the corresponding period last year was 15.9, and for the group of cities, 11.8. The annual rate for eighty-two cities for the forty-seven weeks of 1931 was 11.8, as against a rate of 11.9 for the corresponding weeks of 1930. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

ILLINOIS

Conference of Health Officers.—A conference of Illinois health officers and public health nurses will be held in Springfield, December 17-18. The principal theme of the convention will be ways and means of minimizing the effects of the economic depression on health and of extending more rapidly the newer methods of controlling epidemics. Among the subjects to be presented are poliomyelitis, whooping cough, state diagnostic laboratory in relation to health officers and practicing physicians, recent advances in immunology, convalescent serum in control of communicable diseases, toxoid as a diphtheria preventive, current statistics on diphtheria in the United States, health problems caused by the depression, White House Conference on Child Health and Protection and its medical aspects, new phases of pediatric medicine, public health nursing, economic problems of dental public health, and child hygiene work in the county health unit. Guest speakers will include Harry E. Barnard, Ph.D., director, White House Conference on Child Health and Protection, and Drs. Walter T. Harrison and Estella Ford Warner of the U. S. Public Health Service, all of Washington, D. C.; Mr. C. C. Young, director, state laboratory, Lansing, Mich., and Dr. John E. Gordon of the Detroit health department.

Chicago

Dr. Sigerist to Lecture.—Dr. Henry E. Sigerist, professor of the history of medicine and director of the Institute of the History of Medicine of the University of Leipzig, will deliver four lectures under the auspices of the University of Chicago and Rush Medical College, Institute of Medicine of Chicago, Society of Medical History of Chicago, and Northwestern University. The first lecture will be held, December 7, at the University of Chicago on "Medical Literature of the Early Middle Ages"; the second, December 8, at Rush Medical College, "Medicine of the Renaissance: Fracastor, Paracelsus, Vesalius, Ambroise Paré." The latter will be the John Dodson lecture. The third lecture will be given, December 8, on "Problems and Methods of Historical Pathology," before the Institute of Medicine at the City Club. This meeting will be preceded by an informal dinner in honor of Dr. Sigerist. The last lecture will be given, December 9, at Northwestern University, on "The Sanctuary of Asklepios in Epidauros."

Society News.—At the meeting of the Chicago Urological Society, November 25, Drs. Herman L. Kretschmer and Lawrence E. Pierson, Sioux City, Iowa, spoke on "Fibrolipomatosis of the Kidney"; Harry C. Rolnick and Clement P. O'Neill, "Skin Metastases in Carcinoma of the Bladder," and Benjamin Earl Fillis, "A Spontaneously Expanding Bougie for Ureteral Dilatation."——Dr. Charles L. Scudder, Boston, addressed a joint meeting of the Central States Society of Industrial Medicine and Surgery and the Chicago Society of Industrial Medicine and Surgery, December 2, on "Present Status of the

Treatment of Fractures."——The Chicago Laryngological and Otological Society will be addressed, December 7, by Drs. Samuel Salinger on "Nasal Deformities—Surgical Correction"; Harry L. Pollock, "Implants—History and Use," and Alice K. Hall, "Pharyngo-Mediastinal Abscess Recovery."—— The Chicago Council of Medical Women, at its meeting, December 4, was addressed by Drs. Irma Aleshire and Louise O. Kappes on "Urticaria" and "Food Allergy in Children," respectively.

Health Service for University Employees.—A health service program for the staff and employees of the clinics group, University of Chicago, was approved by the board of trustees and became effective, December 1. The program will be administered by the University Health Service under the direction of Dr. Dudley B. Reed. The contribution of one dollar a month to be deducted from their salaries will be required of all employees. This money will form a fund to be used only for meeting the costs of medical and hospital service to the individual participants in the plan. The plan will be obligatory for all new appointees and reappointments with no exceptions; participation in the public health aspects of the plan will be obligatory for all present employees and full participation, including monthly payments, will be required of all present staff and employees, unless specifically exempted. The benefits to be derived include:

1. All services performed in the outpatient department of the health service; that is, ambulatory medical care.
2. House calls in the district bounded by Fifty-Third Street, Cottage Grove Avenue, Sixty-Third Street and Lake Michigan.
3. X-rays and consultations with other clinics as directed by the health service staff.
4. Refractions (not including glasses).
5. Elective correction of remediable defects after the beneficiary has been a participant in the plan for not less than one year.
6. All necessary hospital expenses up to two months of hospital care, for conditions commonly cared for in the University of Chicago Clinic. This covers accommodations at minimum rates. More expensive accommodations may be occupied, the difference in cost to be met by the individual.

The plan does not include:

1. Hospitalization for tuberculosis, mental and chronic diseases not ordinarily admitted to the clinics except that such cases may be received for purposes of diagnosis.
2. Prenatal and obstetric care.
3. Elective operations for remediable defects discovered at time of employment, it being understood that persons having such defects which might interfere with the proper performance of their duties would, as a condition of their employment, be required to have these defects remedied within three months at their own expense or on their own responsibility.
4. Glasses, appliances and medicines except so far as any of these are included as part of the ordinary hospital care.
5. Dental service, except consultation for diagnosis on request of the health service.

A committee of participants will be formed to advise with the University Health Service. According to Dr. Franklin C. McLean, director, University Clinics, the plan has been under consideration for more than a year.

INDIANA

Personal.—Dr. John W. Morr, Albion, has been appointed health officer of Noble County to succeed the late Dr. John H. Ravenscroft.——Dr. George W. Washburn, Star City, has resigned as health officer of Pulaski County on account of ill health; Dr. Thomas E. Carneal, Winamac, was appointed to fill the unexpired term.

Society News.—The Elkhart County Medical Association was addressed, November 5, by Dr. Ralph M. Waters, Madison, Wis., on "Oxygen Deficiency."——A feature of the Wayne-Union County Medical Society's meeting, November 6, was the presentation of motion pictures on "Anatomy of Female Pelvis and Perineum," "Abdominal Subtotal Hysterectomy for Fibroids," and "Repair of Urethrocele, Cystocele and Laceration of Cervix."——Dr. Donald C. McClelland, LaFayette, addressed the Jasper-Newton County Medical Society, October 30, on "Irradiation Treatment of Benign Uterine Hemorrhage."——A plan for care of the indigent sick was discussed by Dr. Edwin L. Libbert at the October 29 meeting of the Dearborn-Ohio County Medical Society at Lawrenceburg.—— Dr. Robert S. McCaughey, Danville, Ill., addressed the Fountain-Warren County Medical Society at Hillsboro, November 5, on "Disease of the Colon."——Dr. Edgar F. Kiser, Indianapolis, addressed the Hancock County Medical Society at Greenfield, November 6, on "History of Medicine," and J. T. Waldo, D.D.S., "History of Dentistry."——The Thirteenth District Medical Society was addressed, November 4, among others, by Drs. Harold A. Quint, Evanston, Ill., on "Injection Treatment of Varicose Veins"; Francis V. Martin, Michigan City, "Bacterial Endocarditis"; Mark M. Piper, Rochester, "Prenatal Care, with Special Reference to the Offspring"; James L. Wilson, South Bend, "Toxic Thyroid"; Henry J. Graham, Mishawaka, "Appendicitis in Children," and William H. Holmes, Chicago, "Nephritis."——Dr. Lowell G. Hunter, Versailles, addressed the Ripley County Medical Society at Osgood, November 4, on surgery of the sympathetic nervous system.—— The Rush County Medical Society was addressed, November 2, by Dr. Frank C. Walker, Indianapolis, on "Pelvic Infections."——Dr. Raymond W. McNealy, Chicago, addressed the Academy of Medicine, Terre Haute, November 6, on "Blood Vessel Surgery, Past and Present."

KANSAS

Society News.—The Wyandotte County Medical Society was addressed, November 3, by Judge William H. McCamish on "Expert Medical Testimony" and Mr. Joseph Cohen, "The Law of Malpractice." The society was addressed, November 17, by Drs. Earle G. Brown, Topeka, on "Epidemiology of Infantile Paralysis"; James R. Elliott, Kansas City, Mo., "Management of Poliomyelitis During the Stage of Recovery," and Elam A. Reeves, Kansas City, "Placenta Praevia."—— Dr. Russell E. Hobbs, Wichita, and other health officers conducted a discussion on "Immunization Measures and Demonstration of Schick Tests" before the Sedgwick County Medical Society, November 17, and Dr. Morton E. Brownell spoke on "Etiology and Treatment of Acute Iritis."

KENTUCKY

Society News.—The Hopkins County Medical Society was recently reorganized at Madisonville after several years of inactivity.——Members of the Daviess County Medical Society at a meeting in Owensboro, November 10, heard addresses by three Louisville physicians: Drs. James R. Stites, "Surgical Pathology of the Kidney"; Charles D. Enfield, "Urological Roentgenology," and Louis Wallace Frank, "Malignancy."—— Dr. Hiram B. Weiss, Cincinnati, addressed the Campbell and Kenton County Medical Society, Dayton, November 19, on "Clinical Aspects of Coronary Disease."——At the fall meeting of the Fifth District Medical Society, Carrollton, November 12, speakers were three Louisville physicians: Drs. Philip F. Barbour, on "Pneumonia in Children"; Adolph O. Pfingst, "Fracture of the Skull as Related to the Eye," and Benjamin F. Zimmerman, "Encephalography and Ventriculography."

MAINE

Personal.—Dr. James A. Spalding, Portland, was given a complimentary dinner, September 25, by his associates. A portrait of Dr. Spalding was given to the Maine General Hospital in recognition of his service to that institution.

Society News.—The Penobscot County Medical Society was addressed, October 20, by Dr. Magnus F. Ridlon, Bangor, on surgical aspects of certain gynecologic conditions; two motion pictures with sound illustrated the talk.—— Speakers who addressed the York County Medical Society, October 21, were Drs. Clinton N. Peters, Portland, on "Modern Urological Diagnosis"; Chester F. McGill, Portsmouth, N. H., "Posterior Occipital Presentation"; Lawrence R. Hazzard, Portsmouth, "Retrocecal Appendicitis," and George C. Wilkins, Manchester, "Uses of Radium."

MICHIGAN

Society News.—Dr. Raphael Isaacs, Ann Arbor, addressed the Wayne County Medical Society, Detroit, December 1, on "Present Status of Diagnosis and Treatment of Anemia."—— The Oakland County Medical Society was addressed, November 19, in Pontiac, by Dr. Plinn F. Morse, Detroit, on "Comparative Anatomy and Development of the Kidneys and Their Clinical Application."

Personal.—Dr. Alvin H. Rockwell, for twenty-three years health officer and director of health and welfare of Kalamazoo, has offered his resignation, effective January 1.——Dr. William J. V. Deacon was elected president of the Michigan Public Health Association at its meeting in Lansing, November 11; Dr. John D. Monroe, Pontiac, vice president, and Miss Marjorie Delavan, Lansing, secretary.

Society Adopts Dime-a-Day Plan.—A sum of money will be donated to the Emergency Relief Fund of Detroit, through a dime-a-day plan recently adopted by the Wayne County Medical Society. A large box for contributions has been placed in the society's café, where an average of 100 members eat every day, and it is expected that more than $200 will be realized each month for donation to the fund.

Annual Clinic of Physicians' Club.—The sixth annual clinic of the Highland Park Physicians' Club was held at the Highland Park General Hospital, December 5. The program included papers by Drs. Carey Culbertson, Chicago, on "Management of Pelvic Infections, Acute and Chronic: Conservative

and Operative Treatment"; Cyrus E. Burford, St. Louis, "Diagnosis and Management of Stone in the Kidney and Ureter"; John J. Moorhead, New York, "Practice of Traumatic Surgery"; Edwin M. Miller, Chicago, "Problems in Surgery in Children"; Harry S. Gradle, Chicago, "Etiology of Ocular Diseases"; Lee Wallace Dean, St. Louis, "Sinusitis in Children"; Albert Graeme Mitchell, Cincinnati, "Certain Phases of Nutrition in Childhood"; Marion A. Blankenhorn, Cleveland, "Neurological Aspects of Pernicious Anemia"; Frank H. Lahey, Boston, "Carcinoma of the Colon and Rectum: Its Diagnosis and Surgical Treatment," and Daniel L. Sexton, St. Louis, "Disorders of the Hypophysis." In the evening there was a stag buffet supper with entertainment.

NEW JERSEY

Society News.—The Essex County Medical Society held a demonstration clinic on syphilis at its meeting in Newark, November 12, in which the participants were Drs. Harrison S. Martland, Charles Englander, Francis J. McCauley, Newark, and Arthur J. Casselman, Camden.——Dr. Henry L. Bockus, Philadelphia, addressed the Camden County Medical Society, Camden, November 3, on diarrhea.——Dr. Nicholas M. Alter, Jersey City, addressed the Hudson County Medical Society, November 4, on "Practical Aspects of Nephrosis."——Dr. Mather Cleveland, New York, addressed the Bergen County Medical Society, Hackensack, October 16, on "Orthopedic Treatment of Poliomyelitis."——Dr. George M. Dorrance, Philadelphia, addressed the Cumberland County Medical Society, Bridgeton, October 13, on traumatic surgery.——Dr. Wells P. Eagleton, Newark, spoke on "Traumatism of the Frontal and Temporal Regions in Relation to Meningitis" before the Middlesex County Medical Society, Perth Amboy, October 21.——Dr. Henry W. Cave, New York, addressed the Passaic County Medical Society, Paterson, October 8, on "Difficulties Encountered in Operations on the Common Bile Duct."——Among speakers at the annual meeting of the Tuberculosis League of New Jersey, Trenton, October 16, were Drs. Donald B. Armstrong, New York, on tuberculosis in children, and John Bennett Morrison, Newark, "Rôle of the Physician in the Tuberculosis Fight."

NEW YORK

Grade B Raw Milk Abolished.—After July 1, 1932, grade B raw milk will be discontinued in New York. This grade was established in 1928 as a temporary measure to allow producers an opportunity to have their herds tuberculin tested. Its requirements were exactly the same as those for grade A raw milk except that such milk was not required to be from tested cows. In view of the fact that only a small amount of this grade of milk is now being sold, the Public Health Council, November 11, amended the sanitary code to eliminate it, effective July 1, 1932, thus allowing time for the testing of the remaining herds supplying this grade of milk.

County Society Celebrates One Hundred and Twenty-Fifth Anniversary.—The Medical Society of the County of Albany held its one hundred and twenty-fifth annual meeting at a dinner in Albany, October 28. Dr. George W. Crile, Cleveland, made an address on the evolution of the nervous system. Dr. Charles K. Winne, Jr., president of the society, gave an historical summary of the regulation of the practice of medicine in New York since the seventeenth century. Dr. William D. Johnson, Batavia, president of the Medical Society of the State of New York, and Mayor Thacher of Albany also addressed the meeting. Twelve former presidents of the society were present, including Dr. Frederick C. Curtis, Albany, who held the office in 1878.

Society News.—Dr. Royal H. Mayhew, among others, addressed the Franklin County Medical Society, Malone, October 28, on "Home Treatment Versus Sanatorium Treatment in Pulmonary Tuberculosis."——The twenty-fifth annual meeting of the fourth district branch of the Medical Society of the State of New York was held in Glens Falls, October 21-22. The speakers included the following: Dr. Wilder G. Penfield, Montreal, on "Neurology in General Practice—Early Diagnosis of Remediable Lesions"; Dr. Samuel T. Orton, New York, "Obstacles to the Development of Language Function in Children," and Dr. Walter J. Craig, Albany, "The State Orthopedic Program," and John R. Parker, Schenectady, "The Lawyer and Physician in Welfare Work."——Dr. Earl Dorland Osborne, Buffalo, addressed the Schoharie County Medical Society, Cobleskill, October 13, on "Common Skin Diseases, Exclusive of Eczema."——Dr. Arthur B. Soule, Jr., of the University of Vermont School of Medicine, Burlington, among others, addressed the Medical Society of the County of Washington, Hudson Falls, October 6, on "Studies of the Renal Function."——Dr. Clayton W. Greene, Buffalo, presented a paper on "The Medical Man's Attitude on the So-Called Acute Abdomen" before the Genesee County Medical Society, Batavia, October 26.——Four New York physicians presented a symposium on cancer at a meeting of the Yonkers Academy of Medicine, November 18, as follows: Drs. William P. Healy, "Diagnosis and Treatment of Cancer of the Female Genital Organs"; Ralph E. Herendeen, "Indications for Roentgen-Ray Therapy"; Frank E. Adair, "Treatment of Primary Operable Cancer of the Breast," and George T. Pack, "Melanomas and Pigmented Nevi."——A series of lectures on traumatic surgery was sponsored by the Wayne County Medical Society at Lyons during October and November, with the following speakers: Drs. Henry H. Ritter, New York, on injuries to the head; Henry M. Bergamini, internal injuries; David Goldblatt, burns; Emmett A. Dooley, infections and wounds of the hands, and Seth M. Milliken, common fractures.——Dr. Foster Kennedy, New York, addressed the Medical Society of the County of Nassau, Mineola, November 24, on "Head Injuries."

New York City

Faculty Changes at Columbia.—Dr. Allen O. Whipple has been appointed to the Valentine Mott professorship of surgery, which was recently established at the College of Physicians and Surgeons, Columbia University, and Dr. Israel S. Wechsler has been promoted to the professorship of clinical neurology. Dr. Russell A. Hibbs has resigned as professor of orthopedic surgery.

Personal.—Dr. Alfred F. Hess was recently elected to honorary membership in the German Pediatric Society.——Dr. William S. Ladd, formerly on the faculty of the College of Physicians and Surgeons, Columbia University, has been appointed assistant professor of medicine and associate dean of Cornell University Medical College.——Dr. Clyde Wilson Collings was made an honorary member of the French Urological Association in October, when he addressed the annual congress on "Relief of Bladder Neck Obstruction by Electrosurgery."

Gifts for Research.—New York University has recently announced the following gifts for medical research:

Commonwealth Fund, $5,000 for research in rheumatic fever under direction of Dr. William H. Park; $1,750 to Dr. Park for investigation on antipneumonia serum; $1,750 for the Clinical Pediatrics Research Fund in Pneumonia, under direction of Dr. Charles Hendee Smith.

Harriman Research Fund, $8,750 additional for that fund.

Anonymous donor, $10,000 for the Neurological Research Laboratory Fund.

R. T. Crane, Jr., $5,000 for the department of therapeutics.

International Committee for Study of Infantile Paralysis, $3,000 for study of infantile paralysis under Dr. Park.

Josiah Macy, Jr., Foundation, $3,000 for study of chorea under Dr. Smith.

Chemical Foundation, $1,000 for research on pneumonia.

Health Products Corporation, $1,000 for the Pernicious Anemia Fund.

Oxygen Penthouse.—A penthouse containing two oxygen chambers and a room for the treatment of dust asthma and hay fever has been completed on the roof of the Presbyterian Hospital. The oxygen chambers are equipped for the treatment of patients with pneumonia, cardiac failure and other diseases in which the lungs are affected. A dust filtering apparatus has been installed for the treatment of cases of asthma and hay fever. Oxygen is supplied from a central station, with a separate station for the use of carbon dioxide therapy in conjunction with oxygen therapy. The atmosphere is under thermostatic control. These rooms are for private and semiprivate patients, representing an addition to the oxygen chamber in the hospital proper. The chambers are the gift of Dr. Herman B. Baruch; the building itself was erected by the hospital.

Lectures on Social Problems of Tuberculosis.—The New York Tuberculosis and Health Association is sponsoring a series of lectures in cooperation with the New York School of Social Work on "Current Significance of Tuberculosis as a Social Work Problem." Lectures have been given by Louis I. Dublin, Ph.D., November 10, on trends in the past twenty-five years and possible effects of the present economic situation; Dr. Iago Galdston, November 19, etiology and immunity and different forms of tuberculosis; Dr. James Burns Amberson, Jr., November 24, diagnosis and complications of the disease and Dr. Grant Thorburn, December 1, treatment. Bailey B. Burritt, director, Association for Improving the Condition of the Poor, will speak, December 8, on "Tuberculosis and the Family"; Dr. Dwight Clifford Martin of the city department of health, December 15, "Administrative Control of Tuberculosis in New York City," and Dr. Linsly R. Williams, president of the tuberculosis and health association, December 22, on "Opportunity of the Social Worker to Help Control Tuberculosis."

NORTH CAROLINA

Hospital News.—Laurel Hospital, White Rock, in Madison County, has been closed by the Presbyterian Board of National Missions, after fifteen years' service. It was said that improvement in transportation and communication made the maintenance of a hospital in this once isolated region no longer necessary. —— Physicians representing fourteen counties were guests of the Wayne County Medical Society, Goldsboro, at a meeting, October 3, at which Dr. Hubert A. Royster, Raleigh, spoke on treatment of wounds.

PENNSYLVANIA

Personal.—Drs. William H. Mayer, Pittsburgh, and Charles Falkowsky, Jr., Scranton, president and president-elect, respectively, of the Medical Society of the State of Pennsylvania, were guests of honor at a reception given by the Medical Club of Philadelphia, October 16.——Dr. James P. Roth has been appointed surgeon-in-chief of the Locust Mountain State Hospital, Shenandoah, succeeding the late Dr. Herbert H. Holderman.——Dr. Jesse L. Lenker, Harrisburg, was recently elected president of the Pennsylvania Heart Association.

Philadelphia

Society News.—Dr. Bernard Glueck, New York, addressed the Philadelphia County Medical Society, November 25, on "Principles of Psychoanalysis and the Practical Results That May Be Achieved Through This Procedure."——Dr. Basil R. Beltran delivered the postgraduate seminar of the Philadelphia County Medical Society, November 20, on "Surgery of the Vascular System." Dr. Robert G. Torrey gave the lecture, November 27, on tuberculosis.——The forty-fifth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital was held, December 1, at the Pennsylvania Hotel.

Personal.—Dr. Emily Lois Van Loon has been appointed acting head of the department of otolaryngology and bronchoscopy at the Woman's Medical College of Philadelphia, succeeding the late Dr. Margaret F. Butler.——Dr. David H. Bergey, formerly professor of hygiene and bacteriology, University of Pennsylvania School of Medicine, has been appointed director of research in biology for the National Drug Company. ——Ernest Fullerton Cook, Pharm.M., of the Philadelphia College of Pharmacy and Science, was tendered a testimonial dinner, November 16, at which he was presented with the Remington Medal for 1931 (THE JOURNAL, August 1, p. 329). The dinner was given under the joint auspices of the New York and Philadelphia branches of the American Pharmaceutical Association.

Alvarenga Prize Awarded.—The Alvarenga Prize of the College of Physicians of Philadelphia for 1931 has been awarded to Dr. Edgar S. J. King, Melbourne, Australia, for an essay entitled "The Nature of the Stroma of the Ovary." The next award of this prize, which amounts to about $300, will be made July 14, 1932. Essays may treat any subject in medicine but must not have been printed previously or presented in competition for any prize. They must be sent without signature, marked with a motto and accompanied by a sealed envelop containing the name and address of the author. Entries must be received by the secretary of the college by May 1, 1932. Winners of the Alvarenga Prize in recent years have been Drs. H. A. Harris, University College Hospital, London; George M. Dorrance, Philadelphia; J. R. Paul and William U. McClenahan, Philadelphia.

TEXAS

Personal.—Dr. Lorenzo P. McCuistion, Paris, has been selected as the 1931 recipient of a certificate of distinction awarded annually by the Winfield F. Brown post of the American Legion at Paris to a distinguished citizen of the town. Dr. McCuistion, a native of Lamar County, was graduated from the Kentucky School of Medicine in 1889 and has spent all his professional life in Paris. In 1912, with other Paris citizens, he established the Sanitarium of Paris, of which he is physician in charge.

Society News.—Dr. Andrew G. Cowles, San Antonio, addressed the Bexar County Medical Society, October 1, on "Value of Complete Urologic and Gynecologic Examination." ——Drs. Harry G. Walcott and Ben R. Buford, Dallas, addressed the Coleman County Medical Society, Coleman, October 1, on "Abdominal Conditions Producing Heart Symptoms" and "Heart Conditions Producing Abdominal Symptoms," respectively.——Dr. Waldo B. Lasater, Mineral Wells, among others, addressed the Palo Pinto County Medical Society, October 5, on "Resuscitation of the New-Born."

WEST VIRGINIA

Society News.—Dr. Raleigh R. Huggins, Pittsburgh, addressed the Ohio County Medical Society, Wheeling, November 20, on "The Present State of Conservatism in the Treatment of Salpingitis." Dr. George W. Crile, Cleveland, addressed the society, November 6, on "Emergencies in Medical and Surgical Practice."

Hospital News.—A new $100,000 hospital with a capacity of sixty beds was completed at Keyser in October. The new building, known as the Potomac Valley Hospital, is owned by Drs. Thomas E. and Robert W. Bess, replacing the old Hoffman Hospital. It is fully equipped for laboratory and roentgen-ray work and maintains a nursing school as well as a course for laboratory technicians.——St. Joseph's Hospital, Parkersburg, has recently taken possession of a new $500,000 building with a capacity of 100 beds, 12 more than in the old building.

GENERAL

Foundation to Advance Psychoanalysis.—The American Psychoanalytic Foundation has recently been formed in New York for the purpose of fostering psychoanalytic education and science in America. The foundation is incorporated in the state of New York and succeeds the Educational Trust Fund formed by the New York Psychoanalytic Society several years ago. The board of directors of the new organization includes Dr. Abraham A. Brill, chairman, Dr. Smith E. Jelliffe, Mr. Leo S. Bing, Mr. Sam A. Lewisohn and Dr. Clarence P. Oberndorf, 112 West Fifty-Ninth Street, New York, secretary. Mr. Alfred L. Rose is counsel for the foundation.

Annual Seal Sale for Tuberculosis.—The National Tuberculosis Association, through its 2,084 constituent state and local societies, began its twenty-fifth annual seal sale, Thanksgiving Day. Tuberculosis still causes the greatest number of deaths of persons between 15 and 45, the association's statistics show. The first sale of tuberculosis seals yielded only a little more than $3,000; the amount raised by this method in 1930 was $5,300,000. During this quarter century more than 500 sanatoriums have been constructed; clinics for early diagnosis and preventoriums for early care have been established; the tuberculin test and the diagnostic use of the roentgen ray have been brought to a high degree of efficiency, and methods of educating the general public have been developed.

Leslie Dana Medal Awarded.—The Leslie Dana Gold Medal, awarded annually for "outstanding achievements in the prevention of blindness and the conservation of vision," was presented to Edward M. Van Cleve, New York, principal of the New York Institute for the Education of the Blind, at a meeting in St. Louis, November 20. Mr. Van Cleve was selected by the National Society for the Prevention of Blindness in cooperation with the St. Louis Society for the Blind, through which the medal is offered by Leslie Dana, St. Louis. Mr. Van Cleve assisted in the formation in 1915 of the National Society for the Prevention of Blindness, sponsored by the Russell Sage Foundation, and became its first managing director, a position he held for nine years. At one time he was president of the Ohio State Commission for the Blind and, in 1907, was superintendent of the Ohio State School for the Blind. The medal was awarded last year to Dr. George E. de Schweinitz, Philadelphia.

Obstetricians Amend Constitution to Increase Membership.—At the third annual meeting of the Central Association of Obstetricians and Gynecologists in Chicago, October 28-31, the constitution of the association was amended to permit the admission to membership of physicians, resident in states which operate wholly or in part on Central standard time. Through this action physicians resident in Indiana, Michigan, Oklahoma, Ohio, North Carolina and Georgia become eligible to membership provided they (1) are in good professional standing, (2) have been graduated for five years or more, (3) have had special training in obstetrics and gynecology, and (4) have their major interests in the specialty. Dr. Rudolph W. Holmes, Chicago, was installed as president of the association at this meeting, and Dr. Percy W. Toombs, Memphis, Tenn., made president-elect; Dr. Jennings C. Litzenberg, Minneapolis, was elected vice president, and Dr. Everett D. Plass, Iowa City, reelected secretary.

Inventors of Respirator Receive Award.—Philip Drinker, assistant professor of ventilation and illumination, and Louis Agassiz Shaw, instructor in physiology, Harvard School of Public Health, Boston, joint inventors of the "Drinker respirator," received the John Scott Award administered by the

Philadelphia Board of City Trusts at a meeting at Franklin Institute, November 18. Each received a copper medal, and the honorarium of $1,000 was divided between them. The fund for the John Scott Award was given to the city of Philadelphia under the terms of the will of John Scott, a chemist of Edinburgh, Scotland, who died in 1816, to reward those whose inventions "add to the comfort, welfare and happiness of mankind." Among those who have received the award for medical work within recent years have been Drs. Afranio do Amaral of the Antivenin Institute of America, Alfred F. Hess, New York, and Francis Peyton Rous, New York, in 1927, and W. T. Bovie, Ph.D., professor of biophysics, Northwestern University, Chicago, in 1928. The Drinker respirator, which was perfected in 1930, has been used in the treatment of infantile paralysis, drowning, asphyxiation, electrical shock and drug poisoning. Mr. Drinker is the son of Henry S. Drinker, LL.D., Merion Station, Pa., former president of Lehigh University, and Mr. Shaw is the grandson of Louis Agassiz, famous educator and scientist..

Society News.—At the recent annual meeting of the Clinical Orthopedic Society, Dr. William Barnett Owen, Louisville, was elected president; Dr. Rexford L. Diveley, Kansas City, Mo., vice president, and Dr. Eugene B. Mumford, Indianapolis, reelected secretary. The next annual meeting of the society will be held in Chicago.——The American Society for the Study of Arthritis met in Pittsburgh, December 3-4. At an open meeting, December 3, Dr. Reginald Burbank, New York, discussed "Streptococcic Complement Fixation Test in Arthritis" and Dr. Henry Warren Crowe, London, England, "The Pathogen Selective Blood Test as Applied in Arthritis."——The Mid-South Post Graduate Assembly, formerly Tri-States Medical Association of Mississippi, Arkansas and Tennessee, will hold its next annual meeting in Memphis, February 9-12. Dr. Arthur F. Cooper, Memphis, is secretary.——The second annual meeting of the National Conference on Nomenclature of Disease will be held, December 14, at the New York Academy of Medicine, New York.——Dr. Lewis J. Moorman, Oklahoma City, was elected president of the Southern Medical Association at the annual meeting in New Orleans, November 18-20. The association will meet in Birmingham, Ala., in 1932.——The next session of the Inter-State Postgraduate Medical Association of North America will be held in Indianapolis, Oct. 24-28, 1932.

Yellow Fever Volunteers Receive Congressional Medals.—The gold medals authorized by Congress in 1929 for the recognition of the late Dr. Walter Reed and his associates in the famous yellow fever experiments of 1900-1902 have recently been dispatched to the fifteen volunteers who are still living and to the heirs of the seven who have died, according to press reports. Each medal bears the name of the recipient on one side and the words "Conquest of Yellow Fever" on the other. Posthumous awards were for Drs. Reed, Aristides Agramonte, James Carroll and Jesse W. Lazear, who made up the army commission, and for Edward Weatherwalks, Warren G. Jernegan and William H. Dean. Medals were also sent to the following men:

John H. Andrus, Elmira, N. Y.
John R. Bullard, Cuba.
A. W. Covington, Cohocton, N. Y.
Wallace W. Forbes, Minneapolis.
Levey E. Folk, Columbus, Ohio.
Paul Hamann, East Moline, Ill.
James L. Hanberry, Denmark, S. C.
John R. Kissinger, Huntington, Ind.
William Olsen, Los Angeles.
John J. Moran, Mexico City.
Charles G. Sonntag, Jackson, S. C.
Clyde L. West, Toledo, Ohio.
Dr. Robert P. Cooke, Lexington, Va.
Thomas M. England, Washington, D. C.
James Hildebrand, Atlanta, Ga.

Pensions of $125 per month were granted at the same time to all those on the latter list and to the widow of Private Weatherwalks.

CANADA

Hospital Council Organized.—A federation of all provincial, interprovincial, religious and other hospital associations in Canada, to be known as the Canadian Hospital Council, was organized in September. The aims and objects as outlined in the constitution include the following: (1) to coordinate activities of hospital organizations in Canada, (2) to study hospital problems and the relationship of the hospital to the public, (3) to cooperate with other agencies, (4) to study hospital legislation in Canada and (5) to form a nucleus from which may be formed later a Canadian Hospital Association if such a development should be deemed advisable. Dr. Fred W. Routley, Toronto, was named president of the council and Dr. George Harvey Agnew, Toronto, secretary.

Health Regulations Changed.—The department of health of Ontario has recently rewritten the regulations concerning communicable disease, making them conform to recent concepts of epidemiology and bacteriology. Under the new regulations forty-five diseases are notifiable, in comparison with forty-two on the previous list. Goiter and pellagra were removed from the list and five diseases were added, as follows: ancylostomiasis, erysipelas, infectious or epidemic jaundice, undulant fever and trench mouth. Placarding is no longer required for chickenpox, German measles and mumps. The isolation period for measles was shortened to seven days and immunes from quarantined homes are now allowed to attend school. Poliomyelitis contacts are now quarantined for ten days. The isolation period was also increased for smallpox and reduced for scarlet fever. Other regulations deal with the handling of milk, burial and transportation of the dead, and disinfection.

FOREIGN

Lectures of College of Physicians.—Dr. John S. Fairbairn delivered the Bradshaw Lecture before the Royal College of Physicians, November 3, on "Medical and Psychological Aspects of Gynecology." The Fitzpatrick Lectures were delivered by Dr. James S. Collier, November 5 and 10, on "The Development of Neurology from the Commencement of the Nineteenth Century to the Present Time."

New Journal on Maternity Problems.—A new monthly journal, the *Boletín de la Maternidad*, has recently appeared as the organ of the Department of Maternity Hospitals and Prenatal Clinics of the Sociedad de Beneficencia Pública of Lima, Peru. Drs. H. Larrabure and N. Cavassa are the editors. The first and second issues, July and August, contain articles on obstetrics, infant mortality, infant psychology, mental hygiene, statistics of the maternity hospital of Lima, and general news.

Memorial to Sir Charles Hastings.—The British Medical Association has opened a fund to establish a memorial to its founder, Sir Charles Hastings, in celebration of its centenary, which occurs in 1932. A stained glass window in his honor will be placed in the cathedral at Worcester, the city with which Hastings was most closely identified; a tablet will be placed on the house in Worcester where he practiced, and his grave in the Astwood cemetery in that city will be restored and cared for. Any balance remaining after these objects have been attained will be turned over to the Sir Charles Hastings Fund, the income of which is distributed for the benefit of members of the medical profession and their dependents according to the discretion of its trustees. The opening ceremony of the centenary meeting of the association will be a pilgrimage to Worcester, July 24, 1932, when the memorial window and plaque will be unveiled.

Course in Ophthalmology.—The ninth graduate course in ophthalmology given under the auspices of the American Medical Association of Vienna will be offered between Oct. 1 and Dec. 6, 1932, at the I and II Eye Clinic of the Allgemeines Krankenhaus, Vienna. Lectures will be given by Prof. Josef Meller and Prof. Karl Lindner, chiefs of the clinics, as well as other members of the staff. Members of other departments will lecture on their respective subjects, including roentgen rays, the hypophysis and sinuses, endocrine disturbances, radium treatment, embryology and the modified West operation. This course, which was originated ten years ago at the suggestion of Dr. Edward Jackson, Denver, is given in English for a minimum of ten and a maximum of seventeen physicians, at a fee of $250 each. A preliminary knowledge of ophthalmology is presupposed. Applications with a certified check for $100 should be sent to Dr. Adalbert Fuchs, Vienna VIII, Skodagasse 13. Further information may be obtained from Dr. Fuchs or from the American Medical Association of Vienna, Alserstrasse 9, Café Edison.

Society News.—Physicians who wish to participate in the International Congress of Tropical Medicine to be held in Amsterdam, Sept. 12-17, 1932, are requested to notify the secretary, Dr. E. P. Snijders, Institute for Tropical Hygiene, Amsterdam, not later than December 31.——The Third International Congress of Sanitary Technics and Urban Hygiene will be held at Lyons, France, March 6-9, 1932. Information may be obtained from M. le Docteur Garin, Conseiller Municipal, Rue Ménestrier, Lyons.——The Ninth International Congress of the History of Medicine will be held in Bucharest in September, 1932. The principal subjects for discussion will be the evolution of medicine in the Balkan states and the protection of Europe against bubonic plague. Those wishing to contribute papers are requested to forward the title and a summary of the paper to the office of the congress, Str. Stirbey Voda, 86, Bucharest II, without delay.——The ninth congress of the International Society of Surgery will be held in Madrid,

March 15-18, 1932, under the presidency of Dr. Quervain. Topics for discussion will be: diagnosis and treatment of intraspinal tumors, nontuberculous suppurations of the lung, surgery of the esophagus, and recent progress of anesthesia in surgery.

Government Services

Col. Skinner Wins Wellcome Medal

The Henry S. Wellcome medal and prize of $500 have been awarded to Col. George A. Skinner, chief surgeon, seventh corps area, U. S. Army, Omaha, for a paper on "The Influence of Epidemic Disease on Military Operations in the Western Hemisphere." The award was to be made during the annual meeting of the Association of Military Surgeons of the United States, New Orleans, November 30-December 2. The Wellcome award was established in 1916 to encourage study and research on problems connected with the health of armies and the efficiency of the medical services. The competition is open to all medical officers, former medical officers, acting assistant and contract surgeons of the army, navy, health service, national guard, volunteers and reserves and commissioned medical officers of foreign military services.

Annual Report of Surgeon General of Army

Automobiles were the leading cause of death in the United States Army in 1930, according to the annual report of Surg. Gen. Robert U. Patterson. If it had not been for the material increase in the number of deaths from automobile accidents, the mortality rate for the year would have been the lowest on record. All but eleven of the seventy-two deaths from this cause occurred in privately owned cars. Suicides, which, during eight of the preceding nine years, had led the list, were second, and tuberculosis was third, with drowning and cancer in fourth and fifth positions. The average daily strength of the army was 137,299. There were 50,910 enlistments in 1930 as compared with 61,898 in 1929. The annual hospital admission rate from all causes (608 per thousand men) was the lowest recorded in the history of the army. The most notable advance was in the control of communicable diseases, and especially of those transmitted through the gastro-intestinal tract: typhoid, diarrhea and dysentery. The leading causes of admission were bronchitis, gonorrhea, acute tonsillitis, athletic exercises and chronic tonsillitis. The number of malarial fevers was reduced to less than 800 in each hundred thousand men. During the year, 1,546,786 days were spent by the military personnel on sick report, as compared with 1,551,915 in 1929. Of the average 6,815 patients in hospital each day, 62 per cent were in general hospitals, the cost per patient day having been $5.07, a decrease of $0.14 as compared with that of the previous year. The average daily noneffective rate from disease was 30.9 as compared with 31.3 in 1929 and 30.2 in 1928, and the leading causes were gonorrhea, tuberculosis, syphilis, athletic exercises and automobile accidents. The leading causes of disability were dementia praecox, tuberculosis, constitutional psychopathic state, mental deficiency and pes planus. The admission rate (47.7) for venereal diseases was the lowest in the history of the army; the group caused 7.9 per cent of all admissions to hospitals and quarters, 16.3 per cent of the loss of time on account of sickness, 4.6 per cent of the discharges for disability, and about 2 per cent of the deaths. Since the inauguration of the campaign for the prevention of venereal disease in 1909, the army rate has been reduced 73 per cent. The rate for influenza was the lowest recorded since 1888. The report exhibits the vital statistics of the regular army for the calendar year ended Dec. 31, 1930, and covers the general activities of the medical department for the fiscal year ended June 30, 1931.

Typhoid at Fort Des Moines

The first explosive outbreak of typhoid in the United States Army since the close of the World War occurred during October in Battery E, Seventeenth Field Artillery, Fort Des Moines, Iowa, according to the surgeon general's monthly review of the health of the army. Between September 22 and October 31, twenty probable cases of typhoid were admitted to the hospital. Specimens for examination were sent to the Sixth Corps Area laboratory at Fort Sheridan, Illinois, and to the Army Medical School. A report, November 7, showed eighteen cases diagnosed as typhoid and two as fever undiagnosed. All the patients had been inoculated. No deaths had occurred up to the time of the report.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 7, 1931.

Vitamin Standards and Units

A conference of scientific investigators has been held in London under the auspices of the health organization of the League of Nations to consider the establishment of an international standard for the vitamins, defining for each vitamin an arbitrary unit of activity and methods of testing. The members of the conference were drawn from several European countries and the United States. The first question was whether to define in terms of a biologic test or a standard substance. The latter was unanimously adopted.

VITAMIN D

The preparation of irradiated ergosterol (viosterol) already issued from the National Institute of Medical Research was chosen as the international standard for vitamin D. This has been used for more than a year as vitamin D standard in Great Britain. At room temperature it loses potency, but it has been found to remain stable for two years when preserved at 0 C. in the absence of air. The method of preparing the standard solution was defined, and it was agreed that when renewal became necessary laboratories in different countries should cooperate in comparing the new standard solutions with the old so as to insure equivalence. The unit of vitamin D was defined as the activity of 1 mg. of the international standard solution of irradiated ergosterol. If the vitamin is isolated in pure crystalline form during the next few years, the international unit can be redefined in terms of this form.

VITAMIN A

Two substances suggested themselves as standards for vitamin A—cod liver oil and carotene. The fact that the oil, particularly when first expressed, undergoes a loss of vitamin A from oxidation impairs its suitability as a standard. But after a few years further change is slow. Pure carotene, which is transformed into vitamin A in the liver, produces the physiologic effects of vitamin A when given in very small doses. Little is known as to the stability of carotene in respect to its vitamin A action. The fact that it consists of two isomers is of little importance, for they have been found to possess almost similar biologic activity. The conference recommended the adoption of carotene temporarily as an international standard for vitamin A, with a selected sample of cod liver oil as a second provisional standard. Further investigation will be necessary before the permanent reliability of carotene is assured. The carotene is to be made from a number of pure samples prepared in certain specified laboratories by Willstater's method. The unit is the vitamin potency of 0.001 mg. of the resulting mixture.

VITAMIN B

The absorption product prepared in the Medical Laboratory, Java, by the method of Seidell is to be the standard for the antineuritic vitamin B. It is made by extracting rice polishings with dilute sulphuric acid and treating with fullers' earth. The earth with the vitamin adsorbed forms the standard substance. As far as is known, loss of antineuritic vitamin does not occur even when the dry preparation is kept at room temperature for some years. But moisture must be avoided or bacterial decomposition will take place. The material has the disadvantage of being a complex substance and probably contains other B vitamins. The unit is the antineuritic value of 10 mg. of the adsorption product.

VITAMIN C

A suitable standard of reference for vitamin C appears to exist ready made. It has been found that the juice of oranges and lemons varies little in vitamin C potency from year to year. The unit is the activity of 0.1 cc. of fresh juice of the lemon, Citrus limonum.

METHODS OF BIOLOGIC ASSAY

The merits of the different methods of biologic assay were not discussed at any length. The substance under examination and the standard preparation are tested simultaneously by the same method. The test substance should therefore show the same value in terms of the standard, whatever the technic. Thus, for vitamin D tests the conference decided that the "line" test, roentgen examination and determination of bone ash are all equally reliable.

The Evils of Medical Socialism

The scheme of the British Medical Association for a national medical service that would provide treatment for every class and cover the whole field of preventive and curative medicine was described in a previous letter (THE JOURNAL, May 17, 1930, p. 1612). After the crushing defeat of the socialists in the general election and with the stringent economy and overtaxation rendered necessary by their prodigal expenditure, such extension of the medical socialism of the insurance act is not to be feared for the present. In an address to the Windsor and District Medical Society, Sir Ernst Graham-Little, dermatologist and member of parliament for London University, criticized the association's scheme. He said that it would perpetuate and indeed aggravate the radical defect of the present insurance act—the restriction of insurance benefits to what was described in the act as "general practitioner treatment." This was one of the principal reasons for the dissatisfaction of the insured with the service supplied. Sir Arthur Newsholme, formerly principal medical officer to the local government board, obviously no unfriendly critic, described that service in a recent address as "representing in many ways an obsolete ideal of medicine." The drastic reduction of the capitation fee of panel physicians has been described in previous letters. The medical profession had been able to meet this cut with something like equanimity, because panel practice was not the sole resource of the majority of practitioners. "The problem of the outpatient at the voluntary hospitals" had arisen. Partly as the result of dissatisfaction of insured persons with the national insurance service, the number of outpatients at all the hospitals throughout the country has risen continuously during the last decade, and the remarkable position has come about that, notwithstanding a health insurance involving compulsory contributions and therefore no expense on receiving treatment, which was confidently expected to deplete our outpatient departments, the attendance has risen continuously since 1920 until it now exceeds the figure before the act came into operation. The suggestion that the hospitals should receive only such patients as were countenanced by physicians acting under the orders of the British Medical Association was a complete misapprehension of the situation. As the expenses of the hospitals were met by the general public, such an assumption of authority would not recommend itself to those who supported the institutions, who were now largely the working classes themselves.

London's Biennial Epidemics of Measles

It is curious that epidemics of measles occur regularly in London at intervals of two years. They begin in the late autumn, reach a maximum in March, and take some six or seven months to complete the circle of London. Sporadic cases occur in the interepidemic periods, especially in centers of overcrowding, but not until sufficient susceptible material has accumulated are the conditions ripe for starting a new epidemic. The last one occurred in the autumn and winter of 1929-1930 and the next is therefore due this autumn. In each epidemic, no fewer than 50,000 children are attacked. As this number is too great for hospital treatment, the public health committee of the London county council encourages home nursing when it can be carried out under favorable conditions. Indeed, it is difficult to say at the moment whether the council will have at its disposal sufficient accommodation in its fever hospitals to cope with the cases that may require hospital treatment. If not, it will be necessary to call on the general hospitals for assistance during the period of greatest pressure, February to April, 1932. The committee points out that in spite of such propaganda in recent years the belief still prevails that the disease can be lightly regarded and can be treated without medical advice or skilled nursing. The fact is that in the past four years, measles has caused eight times as many deaths as scarlet fever and one and one-half times as many as diphtheria. The London county council and the metropolitan borough councils are taking every precaution to cope with the imminent epidemic. The following advice has been issued: 1. Every effort should be made to postpone the contraction of the disease until after the third or preferably the fifth year, for the younger the child the greater the danger of serious complications. 2. Adequate medical, nursing and hygienic care are the most important means for preventing the complications and a fatal issue. 3. The disease is particularly fatal among children undernourished and living under unfavorable conditions. Special methods of control must be applied to prevent or ameliorate the disease in such children. The *Times* suggests that the best way to prevent infection of young children is to exclude those under the age of 5 years from Christmas or other parties, except perhaps family parties. Infection usually has its headquarters in the school. When school children come in association with infants, for example at Christmas time, the infection epidemic gathers force. If young children must go to parties they should associate only with those of the same age, under the school age.

PARIS

(From Our Regular Correspondent)

Oct. 28, 1931.

The French Congress of Hygiene

Among the topics on the program of the eighteenth French Congress of Hygiene this year was the protection of civil populations, in time of war, against war gases. Sieur, *médecin inspecteur général,* did not hesitate to say that, in spite of solemn agreements entered into by the nations of the world, it was likely that they would have recourse to the use of these gases, in case of war, without the least scruples. In the countries bordering on France, there are no doubt large supplies of gas shells—likewise in Russia. The accident that occurred in a Hamburg plant, a few years ago, costing the lives of some thirty persons, through the escape of phosphine gas, is evidence of the fact. Furthermore, all the chemical manufacturing plants that produce nitrogen compounds to be used as fertilizers can be equipped within a few hours for the intensive production of war gases. Professor Messerli of Lausanne projected some interesting illustrations, taken from German and Russian magazines, showing the drills to which the civil populations are periodically subjected in order to become accustomed to the wearing of masks for protection against war gases. Colonel Laure, representing le maréchal Pétain, explained a system of preventive measures to be adopted in case of a gas attack: rapid evacuation of the population, creation of shelters supplied with properly filtered air, masks of various kinds, special hospitals for the treatment of gassed persons, and the like. Mr. Marcelle presented a new style of mask. Professor Parisot

of Nancy gave an account of a gas mask drill that was recently held in that city for the purpose of accustoming the population to the wearing of a gas mask. He recommended that police officers, firemen and hospital nurses be given, in time of peace, special instruction that would enable them to render intelligent aid to victims. There were also long discussions on the rôle of hygienists in connection with the new law pertaining to social insurance. Mr. Dequidt, *inspecteur général,* Professor Parisot, Dr. Boulangier, Dr. Pigot and Mlle. Chaptal presented communications dealing with the topic. Dr. Cuvier spoke on the collective organization of donors for blood transfusion. Dr. Grasset discussed the question of antityphoid serotherapy. Carrieu and Pappas spoke on the rôle of mollusks and other shell fish in the transmission of typhoid. The congress was prolonged in order to afford the conventionists an opportunity to inspect carefully the pavilions of the Colonial Exposition, where were displayed many documents pertaining to colonial hygiene and to the crusade against tropical diseases.

The French Gynecologic Congress

The congress of the Association des gynécologues et obstétriciens de langue française met recently at Bordeaux under the chairmanship of Prof. Jean-Louis Faure. In his inaugural address, Professor Faure urged his colleagues to seek to simplify the technic of important gynecologic operations and to improve the instrumentation so as to reduce to a minimum the number of aids and assistants that a surgeon requires. Mr. Cotte of Lyons presented a paper on radiologic diagnosis in gynecology, the first question on the program, considering in turn pneumoperitoneum and the injection of iodized oil into the uterus and the tubes. He considers the last-mentioned method valuable for the testing of tubal patency and the diagnosis of sterility in women. Inflammatory accidents of the tubes constitute 0.43 per cent. Injections into a hemorrhagic uterus should be avoided for fear of embolism. The second paper was that of Mr. Henrotay of Antwerp, who spoke on obstetric roentgen diagnosis—roentgen pelvimetry, which is difficult and does not permit the measurement of the fetal head; early diagnosis of pregnancy, which is possible only with the beginning of the fifth month but which is of great value from the medicolegal point of view; diagnosis as between pregnancy and tumor, which is often useful; diagnosis of a twin pregnancy, only with the beginning of the sixth month; diagnosis of the death of the fetus through demonstration of overlapping of the bones of the fetal cranium; and ectopic pregnancy associated with the injection of iodized oil. In the discussion that followed, Mr. Douay of Paris, who has made 709 explorations with iodized oil and 576 insufflations, declared that the results are essentially the same with the two methods. Each gave him from 8 to 10 per cent of pregnancies during the year that followed the examination. The only danger is infection in case of hydrosalpinx. A third paper was furnished by Hamant of Nancy and Koenig of Geneva, on the social means of discovering cancer of the uterus. In the treatment of this form of cancer great progress has been made. Unfortunately, in 50 per cent of the cases the patients do not consult a physician until the lesions are too far advanced. Ordinarily, it may be said that uterine cancer is incurable after the lapse of from five to six months after the appearance of its first signs. The essayists recommended that physicians familiarize themselves with the early signs of uterine cancer and advised every woman more than 30 years of age to be examined at least every year—better would be every six months. Especially women who have presented, since confinement, lacerations of the cervix, and those who have had numerous pregnancies, should be examined periodically, for which purpose convenient anticancer centers should be created and the attention of the public called to them.

A fourth paper, on "Late Hemorrhages of the Postpartum Period," consisted of two parts, one part being presented by Anderodias and Péry of Bordeaux, and the other by Professor Couvelaire of Paris. Grave hemorrhages are caused chiefly by an infection. Others yield to ergotine, hot intra-uterine injections and uterine massage. Couvelaire considers curettage dangerous or ineffective. He prefers medical treatment, local or general vaccines, and, if need be, hysterectomy, which results, it is true, in 50 per cent of mortality; but it is resorted to only in cases that would otherwise result fatally. Mr. Keller of Strasbourg recommends, as a prophylactic measure, careful examination of the uterine cavity after every confinement. Numerous unofficial communications were then presented—on the examination of the urine for the presence of the hypophyseal hormone as a method for early diagnosis of pregnancy; on the use of the B C G vaccine in normal new-born children, on the use of diathermy in gynecology, and others.

The French Society of Gynecology

Every year the Société française de gynécologie holds a plenary session at which many important questions are discussed, with the aid of foreign scientists. The first paper was presented by Mr. Ulrich on "The Chemism of the Vagina and Its Physiologic Significance." He pointed out that, in the whole economy, only the stomach and the vagina supply acid secretions, the vaginal secretion containing lactic acid. He then took up the dosimetric methods by which the vaginal acidity can be quantitatively determined; discussed the rôle that such acidity plays with respect to the vaginal microbic flora, and the origin and behavior of vaginal acidity during the life of the woman. He gave then one theory as to the genesis of this acidity and pointed out in closing that temporary or lasting constitutional hyperacidity of the vagina may be the cause of sterility.

In another paper, Mr. C. O. Guillaumin considered the best chemical conditions for the development of various germs in the vaginal secretions. In a third paper, Mr. Martin of Angers discussed the indications for various surgical interventions in the treatment of nontuberculous chronic salpingitis. He stated that gynecologists had become, in this field, much less inclined to operate than formerly—since cures had begun to be effected by diathermy, and radioscopic examination of the tubes into which iodized oil has been injected has made possible the determination of their patency. Among the unofficial communications presented, mention may be made of those that favor the return to vaginal hysterectomy (Violet); the criterion of recovery from gonorrhea in the woman (Bender); the treatment of colibacillary manifestations in the woman (Colanéri), and phlebitis and periphlebitis of uterine origin (Maurice Fabre).

The Thirty-First French Congress of Urology

The thirty-first Congrès français d'urologie was held, October 6, at the Faculté de médecine, under the chairmanship of Dr. Gauthier of Lyons. A single topic was on the program: "Postoperative Acidoses." Dr. Chabanier, in collaboration with Dr. Lobo-Onell of Santiago, Chile, presented a comprehensive introductory paper. After general statements on the notions of acidosis, the paper took up keto-acidosis in persons with true diabetes, keto-acidosis in persons without diabetes, and postoperative acidoses without ketosis. Christol of Montpellier and Chauvin of Marseilles presented their individual opinions on various questions. A large number of communications on various questions of urology were discussed at length.

Session of the Academy Devoted to Colonial Medicine

October 13, the regular session of the Academy of Medicine was devoted entirely to colonial medicine, in connection with the Colonial Exposition, which will soon close. The governors of the various colonies, present in Paris at the time, were on the platform in full dress; also several foreign scientists:

Sanarelli of Rome, Cantacuzène of Bucharest, Ricardo Jorge of Rio de Janeiro, Henrijean of Liége, and Madsen of Copenhagen. Professor Marchoux of the Institut Pasteur delivered an address on the present status of the question of malaria, with the indications for new drugs proposed to take the place of quinine, plasmochin and Fourneau 710. Mr. Mathis discussed the question of spirochetoses occurring in French West Africa. Mr. Mesnil spoke on trypanosomiasis, or the sleeping sickness. Mr. Dinguizli Bachir of Tunisia gave an account of the progress in that country in health work since the creation of a bureau of social hygiene.

BERLIN

(From Our Regular Correspondent)

Oct. 19, 1931.

International Congress of Women Physicians

The International League of Women Physicians, which draws its membership from twenty-six countries, assumed the task of studying some sociohygienic problems that women physicians regard as their special field of investigation. The International Congress of Women Physicians, held in Vienna under the chairmanship of the French woman physician Dr. Thuillier-Landry, attracted 200 participants. One of the topics was "The Work of the Woman Physician in Tropical Countries." Forty woman physicians from India, Persia, China, Japan, Egypt, Palestine and Africa submitted replies to the questionnaires sent out. The papers of Dr. Balfour of India and Dr. Garnier of Algeria gave an insight into the terrible hygienic conditions under which women live in tropical countries. As women physicians inspire great confidence almost everywhere, so long as they do not antagonize too sharply religious customs, a wide field of action is opened to them, particularly through the creation of consultation centers for mothers, maternity hospitals, eye policlinics, training of nurses and education of the people in hygiene.

LAWS FOR THE PROTECTION OF WORKING WOMEN

The papers of the second day, on "Laws for the Protection of Working Women," presented by Dr. Sorrentini of Rome, Dr. Bang of Oslo and Dr. Adler-Herzmark of Vienna, led to a lively discussion. The Scandinavian physicians and a portion of the English and American physicians, who support the "open-door" movement, are fighting, above all things, for the principle of equal rights for women, and therefore reject special protection through legislation. They contend that women with, for example, better pay for night work should look out for the preservation of their health themselves. The need of protecting pregnant women is not denied; but the period of protection should be regarded as a period of sickness and the sick benefits should be paid by the sick benefit associations. The better standard of living of the Nordic peoples has doubtless led to this attitude. According to the German conception, the protection of mothers is one of the chief forms of protection for working women, since without such protection they become worn out early in life through the double burden of the household and the work in a factory and are liable to become permanent invalids, and furthermore because certain industrial poisons, such as lead and benzene, injure the child in utero. Two German industrial women physicians (Krüger of Dresden and Rosenthal-Deussen of Magdeburg) called attention to the fact that the time is past when, for the sake of the principle of equal rights, the physiologic peculiarities of woman are denied. In view of the constraining force exerted by present economic conditions, it is the duty of women physicians to prevent selfish interests from exploiting the health and strength of women.

Since the greater percentage of working women are married, they take care of the home and the children. It is impossible for them to secure adequate rest. How is the pregnant textile worker to protect herself when the inexorable movements of the loom prevent her from resting between the tiresome bending and lifting? How is she to protect herself when constantly new machines and new poisons make their appearance in the industries? In view of the modest demands that women make on industry, there is danger that labor forces may be drawn into those countries that are most backward from a sociopolitical and sanitary point of view.

In closing, a resolution was adopted demanding the creation of uniform, international laws for the protection of labor; furthermore, supervision of industrial plants by specially trained industrial physicians, compulsory instruction of students in industrial hygiene and occupational diseases, far-reaching control of home work as it concerns men and women, and the carrying out of the principle of "Equal pay for equal work for men and women."

Retrenchment in Child Welfare Societies

The Deutsche Gesellschaft für Kinderheilkunde, filled with anxiety concerning the dire effects of threatened retrenchments in children's aid made necessary by the stringent economic conditions, issued at its recent meeting the following proclamation:

> With great anxiety German pediatricians look forward to the future of the German people. Already they observe in Germany and Austria conditions similar to those seen during the worst years of the war and postwar period: general debilitation, reduced resistance to disease, and increase of tuberculosis. As a result of economic distress, the birth rate has declined considerably. But—worse still—the small number of children born are seriously threatened in their development. And under these conditions, the organizations that have been slowly and laboriously built up to supply aid to sick children are to retrench? Are also hospitals to be closed; are sick children to be dismissed from hospitals before they are well, and are welfare centers to be abolished? In the face of such threatened action, the Deutsche Gesellschaft für Kinderheilkunde cannot remain silent. It warns against the great dangers that threaten the life and health of our children, and protests most decidedly against any ill planned restrictions on the aid to be given children in need. To be sure, retrenchments will be necessary; but they must not be introduced at the expense of our children, in whom lies the hope of the German people.

Suicide and Economic Conditions

It is recognized today that a large proportion of the cases of suicide are due to mental disease or to abnormal predispositions. In many countries there has been an increase of suicide since the end of the war, especially in the cities. Recent statistics represent Switzerland as having the highest percentage of suicide: 2.6 per 10,000 inhabitants; Germany with 2.5 suicides per 10,000 of population; Japan, 2.1; France, 1.9; United States, 1.6; England, 1.2, whereas in Italy, the Netherlands, Norway and Spain there is not 1 suicide per 10,000 of population. The percentage of men committing suicide has always been greater than that of women; but of late the percentage of women has been increasing, which may be due to the fact that women are more frequently engaged in occupational activities. Aside from the mental disposition of the population, no doubt the economic situation plays an important part, as Dr. Hans Dornedden, with the federal bureau of health, has emphasized in a recent number of the *Deutsche medizinische Wochenschrift*. The influence of the density of the population manifests itself in the fact that the suicide rate in the large cities is higher than elsewhere. Of especial significance was the trend of events after the war. In 1918, suicide among males of the wage-earning age groups dropped to half that of the last prewar year. The year of inflation (1923) brought a great many suicides among persons in the seventies, who through the depreciation of money values lost their means of subsistence. Later, however, suicide among aged persons became less than before the war, because the public welfare departments rendered aid to the aged. During the years 1926 and 1929, the frequency of suicide among men and women of wage-earning age was augmented because of the increased difficulty of securing employment. Thus, the statistics on suicide

are, in a sense, a barometer of the economic conditions. But the typical curve of the suicide months, which reaches its apex in the spring and drops, toward the end of the year, to about two thirds of the maximum, is yet to be explained. While it is true that the suicide rate shows an increase as employment becomes more difficult to secure, there are other factors that are more stable than the fluctuations of economic life. For example, after the economic crisis of 1876-1885 it was observed that the high suicide rate did not decline when conditions improved, doubtless because the habit of seeking escape in this manner from the struggles of existence had first to be overcome. On the other hand, the lack of employment in 1931, even at its worst, has not affected the mentality of the people in such a manner that suicide has shown any great increase. It appears rather that the great difficulties have aroused the courage of the people and fitted them to struggle with unfavorable conditions. In this connection, it is observable that misfortunes and distress that rest more or less uniformly on all the people do not commonly bring about an increase of suicide. Individuals feel, under such circumstances, that they are part of an inseparable whole and are more inclined to resist the temptation to end their lives.

CAPE TOWN

(From Our Regular Correspondent)

Oct. 14, 1931.

The Annual Medical Congress

The twenty-fifth annual medical congress, the fourth held under the auspices of the Medical Association of South Africa, was opened at Johannesburg, September 14, and was attended by about 400 physicians from all parts of the Union and by delegates from Rhodesia, Kenya and the Congo. These annual medical meetings, first started in 1893 and now popular features of our medical life, are less scientific gatherings than social reunions of which advantage is taken by all medical men who can afford to take a holiday. Owing to the vast distances to be traversed and the difficulties of railway traveling the attendance is not usually representative, but this year's meeting may be said to have been fully representative both of the profession and of the medical association, in that 25 per cent of the association members turned up. As the association represents nearly 88 per cent of all practicing physicians in South Africa, this proportion is highly satisfactory. Translated into relative American figures, it would mean that some 40,000 medical men attended such a meeting in the United States. This success is largely due to the lure that Johannesburg has. It is the fourth time that the congress assembled there, the first meeting having been in the troublous time immediately succeeding the year of the Jameson raid, and the last in 1922. The first Johannesburg meeting is still talked of with enthusiasm by old members, for those were the days when it was still a city of adventure and romance. Today it is more sober, but none the less conscious that it is the economic and industrial hub round which the rest of South Africa turns. It does things on the grand scale, and the congress was no exception, for the program was so full that most of the members were utterly fatigued before the middle of the week was reached.

THE PRESIDENTIAL ADDRESS

The president of the congress was Dr. Francis Napier, one of the oldest and most respected specialists in the country, who in the past has done excellent service as a legislator. His subject for the presidential address was a highly controversial theme, "A State Medical Service," and opinions differ widely on the desirability of saying what he had the courage to say. He pointed out that there was a tendency to become too individualistic in the profession and that such rampant individualism constituted a danger to the public. His frank opinions have given rise to considerable discussion and some resentment. Many feel that some such pronouncement should be made in the interests of all concerned. We are now training our own medical men, and it is possible that we are trying far too much to train them in the direction of making immature specialists out of them instead of endeavoring to shape them into good general practitioners. In isolated rural areas the general practitioner must undertake emergency operative work when he is faced with it, but unfortunately many general practitioners do major operations for which they have neither the experience nor the training. The adumbration of a state medical service is hardly a fit subject for such an oration, but the choice may be excused because the profession has been much intrigued by the various proposals made to give adequate medical services to the rural and native areas. In a former letter I mentioned the memorandum which had been drawn up on the subject by the federal council of the association. This has now, with some slight modifications, been presented to the minister of public health, who is already dealing with the program of activities recommended by Professor Swellengrebel in his report on malaria. The association, briefly, supports an extension of the existing system of district surgeons, a system that took root in the Cape Province but has never been popular in the other provinces. Dr. Napier pleads in his presidential address for the institution of a state medical service, modeled apparently on the system now existing in Basutoland. Both the government and the lay public are keenly interested in the subject. With the proposal to do away with the present provincial system of political control of education, public health and roads there is a desire on the part of the public to have some concrete suggestions for improving the present position as regards medical aid. Possibly some measure of devolution will be favored, and something similar to the Canadian system of rural medical officers may come up for consideration. Conditions in some rural districts are so bad that there is practically no private practice, and the practitioners live on what they obtain from the state. In such areas there is already, for all practical purposes, a state medical service, although it exists under conditions which are irksome to the practitioner and of little benefit to the public. Dr. Napier's frank discussion of the pros and cons will at least enable the public to see that the medical profession is not afraid to contemplate the possibility of a state medical service, provided the conditions of service are such as to satisfy both sides.

SCIENTIFIC PAPERS

There was no paper of outstanding importance read at the congress. The committee rightly tries to make these meetings attractive and instructive to the general practitioner, and ultra-scientific papers that need for their discussion intimate specialized knowledge are discouraged. Many papers of general interest were read. Perhaps the most important discussion was that initiated by Dr. Lance Impey of Cape Town, on "Medical Attendance in Pregnancy and the Puerperium." In the discussion the need for specialist attention, for intelligent examination of the pregnant mother, and for equally skilled antenatal treatment was stressed. Dr. Marchand gave an interesting paper on "Obstetrics Among South African Natives." The initial paper, on constipation, introduced a brisk discussion in which various speakers emphasized the fact that constipation was as common among natives as among whites, and that the evils due to intestinal stasis were probably due more to mechanical than to toxic causes. Before the section on medicine the Phthisis Bureau of Johannesburg contributed a paper on the number of tuberculosis and silicosis cases, explaining the difficulties of the definite diagnosis of pulmonary tuberculosis with x-rays. In the section on surgery the opening session was devoted to a discussion on appendicitis, but the paper that roused the greatest interest was that of Dr. Lee Mac-

gregor on the surgery of the sympathetic nervous system. The public health section had one paper of outstanding interest, Dr. Sampson's admirable discussion of the etiology of blackwater fever and its relation to malaria. Considerable interest also was aroused by a preliminary report by Dr. Scroggie, medical officer of health for Port Elizabeth, on a new type of fever with some resemblance to typhus fever, observed in his area; the probability is that the disease is due to a Rickettsia body, but further bacteriologic and clinical research is required before it can be accepted as a clinical entity. The public health section held a combined meeting with the psychiatric section in which the subject of the sterilization of the unfit was discussed. The introducer, Dr. Dunston, commissioner for mentally disordered persons in the Union, made a strong plea for the compulsory sterilization of mental defectives, but an equally strong case against such sterilization was made out by his opponents. The public is interested in this subject, largely owing to the provocative statements that are made in the lay press about the high percentage of mentally defective juveniles in the population. There has been no authoritative survey of mental defectiveness in the Union and the percentages are more or less guesswork, for many of the statistical data are derived from the results of intelligence tests. The work in the other sections presented nothing of particular interest.

The Cancer Conference

A conference on cancer, convened by the administrator of the Transvaal Province at the instance of the Johannesburg Hospital Board, was held immediately after the congress and was well attended, although interest waned after the first day. The conference discussed the advisability of founding a national society for fighting cancer and decided on its establishment. The society is to be affiliated with the Imperial Cancer Research, and its work will be mainly to educate the public. Originally it was intended that the conference should also authorize the establishment of a cancer research institute, but the idea has been deprecated, as it is argued that cancer is not a disease of immediate economic importance in South Africa and that, in comparison with malaria, tuberculosis and rheumatic fever, its urgency is of less importance. The conference took no resolution on this subject or on the matter of the purchase of a radium bomb for distant treatment. The enthusiasm of the conveners had lessened by the time the conference met, and the only practical result of the meeting was the establishment of a South African anticancer society, which will probably have as long and as uneventful a life as the antimalaria societies in the past. The fact is that while the public has a reasonably active interest in cancer, it feels that there are other diseases of far greater importance in this country, which stand in need of investigation, and that we already have an excellent research institute at Johannesburg in the South Africa Institute for Medical Research, which is financed partly by the mining industry and partly by the government and is under the able directorship of Sir Spencer Lister.

Research on Malaria

The institute has just published a report by Professor Swellengrebel and his co-workers on the incidence of malaria in the Union. Professor Swellengrebel's report to the government was written in simple, popular language, and has resulted in the government taking action. Most of the recommendations which he suggested will be adopted. A malaria research institute, in charge of Dr. Annecke, is being established in the low veld, and adequate provision is being made for the treatment of malaria cases in rural areas. Professor Swellengrebel in a carefully written scientific report discussed the question of the relative immunity or toleration possessed by the aboriginal native living in malarious areas. He and his co-workers have carefully examined both the adult and the juvenile population in some of the locations situated in the most fiercely endemic districts, and have come to the conclusion that natives in such areas possess a real tolerance which is of industrial and economic importance. The report is one of the most interesting papers on malaria that have been published on this side.

JAPAN

(From Our Regular Correspondent)

Sept. 26, 1931.

Personals

Prof. Dr. Yokota, who retired as chief of hygiene in the medical department of the Tokyo Imperial University, was succeeded by Dr. Tamiya, professor in the university and a member of the Government Institute for the Study of Infectious Diseases. He had a scholarship in the Rockefeller Institute for the years 1914-1916.

Dr. Sato left Yokohama for Europe by way of America, July 16. He is a member of the lower house of the imperial diet, elected from Fukuoka prefecture, and was to attend the international conference of national representatives in Budapest in October.

Dr. Professor Kitajima, chief of the Keio Medical College and president of the Japan Physical Association, has been appointed medical superintendent of the Saiseikai Charity Foundation, succeeding the late Baron Dr. Kitasato.

Dr. Tomura, who had been chief of the health bureau of Tokyo, resigned from his post and was succeeded by Mr. Ishibashi, secretary of the bureau.

Owing to the death of Baron D. Kitasato, founder and director of the Kitasato Institute, Dr. Kitashima, former vice director, was unanimously elected director, and Dr. S. Hata was elected vice director.

Dr. Rajchman of the League of Nations arrived in Tokyo, September 10, on his way to inspect health conditions in China.

Dr. Takayama, professor in the Kyushu Imperial University, who resigned, has been appointed an emeritus professor of the university.

Dr. Miyajima, permanent commissioner of the narcotic section of the League of Nations, will be in Tokyo in the middle of November after visiting America on his way home.

Professor Gann of the Rockefeller Foundation, who recently arrived in Tokyo, visited the health bureau of the home ministry to talk over the proposed establishment of the health center and school of public health and hygiene in this country. August 6, he visited the government dietetic institute and other places, and attended the dinner party given in his honor by Mr. Adachi, home minister, in the evening.

Dr. Johnson of the University of Pittsburgh School of Medicine, who came to this country as a representative of the American Eugenic Society, was welcomed by the Japan Physical Hygienic Association at the Hitotsubashi Club at Kanda, Tokyo, July 25. At this meeting he gave a lecture on the practice of sterilizing feebleminded persons in America. His schedule for the two months' stay in this country was arranged and the home ministry gave an order that he could lecture without inconvenience at the places where he would go.

Sanatoriums and Asylums

The Yamaguchi branch of the Japan Red Cross Society is going to establish a new sanatorium at the town of Onoda. It will contain forty beds when completed.

The Wakamatsu Sanatorium, which is in Kanazawa City and has sixty beds at present, is also going to enlarge the capacity by twenty beds.

The Satojima Leprosy Asylum, which has accommodations for 550 patients at present, is going to enlarge the capacity by 450 additional beds.

Infectious Diseases in Dormitories

The educational ministry has conducted an investigation of the number of cases of infectious diseases that broke out among the students in the dormitories in this country. The cases of dysentery were the largest in number, there being eighty-seven; next came the eighty-two cases of typhoid; then twenty-two cases of paratyphoid fever, then five cases of diphtheria, and lastly two cases of scarlet fever. The number of cases for five years and the deaths are as follows:

Year	Number of Dormitories	Number of Cases	Deaths
1927.....	110	235	7
1928.....	120	254	7
1929.....	8[illegible]	151	8
1930.....	9[illegible]	187	8
1931.....	113	208	8

New Regulations for Narcotic Drugs in Taiwan

The government of Taiwan (Formosa) has issued new regulations for opium and other narcotic drugs this year. Opium is not allowed to be handled except by licensed pharmacists and druggists. A person who is suspected of being an opium eater shall be detained in an opium eaters' hospital for observation. In using any preparations of narcotic drugs, physicians must obtain licenses from the local governor whenever in need of them for their patients.

Epidemic of "Dengue Fever"

An epidemic of "dengue fever" which broke out in the Loochoo Islands last July was reported by the local government to the effect that there were 13,969 cases, 136 of which terminated fatally, between July 13 and 19. The authorities concerned on the islands did their best in killing the mosquitoes. The symptoms are reported to be like those of influenza at first; then come typical states of fever accompanied by eruption. Some patients improved after two or three days of pain in the joints, and eruption; others continued to suffer for a week or more.

Cholera

Dr. Katsumata, health officer of the department of the interior, returning from Shanghai in August reported the health conditions there to be very good because of the inoculations against cholera made among the inhabitants. August 24, however, two cases were found on board the British steamer which had touched at Shanghai on the way to Kobe. The patients had been infected in Shanghai, and the next day another case was found. September 7, a case was reported at Fukuoka, Kyushu, in a Chinese who had just arrived from his native country.

Marriages

JAMES C. OWINGS, Baltimore, to Miss Constance Macgill Carey of Riderwood, Md., at Ruxton, November 14.

EDWIN FOSTER GOULDMAN, Colonial Beach, Va., to Miss Margaret Reid of Washington, D. C., October 13.

GEORGE PRESTON NOWLIN, Charlotte, N. C., to Miss Mary Ann Jones of Lynchburg, Va., October 10.

JAMES WINSTON WATTS, II, of Chicago, to Miss Julia Meem Harrison of Lynchburg, Va., in October.

CLABE WEBSTER LYNN to Miss Grace Lunsford Friend, both of Petersburg, Va., October 17.

JAMES BANNISTER STONE to Miss Janet Watkins, both of Richmond, Va., November 3.

JACOB GOLDBERG to Miss Rose D'Vorkin, both of Long Branch, N. J., November 5.

DEWITT C. DEVER to Miss Dorothy L. Fraley, both of Seattle, October 29.

Deaths

Louis D. Brose ⊕ Evansville, Ind.; University of Pennsylvania School of Medicine, Philadelphia, 1881; member of the American Academy of Ophthalmology and Oto-Laryngology and the American College of Surgeons; past president of the Vanderburgh County Medical Society; delegate to the Pan-American Medical Congress in Washington, D. C., in 1893, the International Medical Congress in Berlin in 1900 and the International Otological Congress in Boston in 1912; demonstrator and professor of anatomy, Evansville Medical College, until it dissolved in 1885; for many years oculist and aurist to St. Mary's Hospital; aged 72; died, November 15, of hypostatic pneumonia.

Norton Luther Wilson ⊕ Elizabeth, N. J.; Bellevue Hospital Medical College, New York, 1884; past president of the Medical Society of New Jersey and the Union County Medical Society; formerly member of the board of health; member of the American College of Surgeons; senior ophthalmologist and otolaryngologist to the Elizabeth General Hospital and consultant to St. Elizabeth's and Alexian Brothers' hospitals; formerly member of the board of managers of the Bonnie Burn Sanatorium, Scotch Plains; aged 70; died, November 13, of heart disease.

Archibald Mercer, Newark, N. J.; College of Physicians and Surgeons in the City of New York, 1871; member, past president and for thirty years treasurer of the Medical Society of New Jersey; secretary, 1878-1906, and president in 1906, Essex County Medical Society; police surgeon, 1881-1883; medical superintendent, visiting surgeon and on the staff of the St. Barnabas Hospital, 1880-1921; surgeon to the New Jersey Home for Disabled Soldiers, 1891-1897; aged 82; died, November 3, of chronic interstitial nephritis and cerebral hemorrhage.

Frederick Asser Asserson ⊕ Medical Inspector, Commander, U. S. Navy, retired, Newport, R. I.; University of Virginia Department of Medicine, Charlottesville, 1899; member of the American College of Surgeons and the New England Surgical Society; entered the Navy in 1901 and retired in 1920 for incapacity resulting from an incident of service; aged 52; on the staff of the Newport Hospital, where he died suddenly, November 6, of heart disease.

Carter Slocum Fleming, Fairmont, W. Va.; College of Physicians and Surgeons, Baltimore, 1914; member of the West Virginia State Medical Society, and the American College of Surgeons; past president of the Marion County Medical Society; gynecologist and obstetrician to the Cook Hospital; aged 40; died, in November, at the Walter Reed General Hospital, Washington, D. C., of a self-inflicted bullet wound.

Lemuel Fox Woodward, Worcester, Mass.; Harvard University Medical School, Boston, 1882; member of the Massachusetts Medical Society, and the American College of Surgeons; consulting surgeon to the Worcester City and Memorial hospitals, Worcester, and the Hospital Cottages for Children, Baldwinsville; aged 74; died, November 12, of arteriosclerosis and cerebral hemorrhage.

Lawrence Evans Chapman, Galveston, Texas; University of Texas School of Medicine, Galveston, 1915; member of the State Medical Association of Texas, and the American College of Physicians; associate professor of clinical medicine at his alma mater; on the staff of the John Sealy Hospital; aged 44; died suddenly, October 21, of coronary occlusion.

Edward Dunaway Allgaier ⊕ Cincinnati; Medical College of Ohio, Cincinnati, 1908; formerly instructor in clinical pediatrics, and clinical otolaryngology, University of Cincinnati College of Medicine; on the staff of St. Francis Hospital; aged 48; died, November 6, in the Deaconess Hospital, of injuries received in an automobile accident.

Robert James Talbot ⊕ Niagara Falls, N. Y.; Baltimore Medical College, 1909; member of the American College of Surgeons; physician to the Niagara University; formerly health officer of Niagara Falls; on the staffs of St. Mary's and Niagara Falls Memorial hospitals; aged 49; died, October 30, of tuberculosis of the throat.

Marvin R. Stone, Parkersburg, W. Va.; College of Physicians and Surgeons, Baltimore, 1908; member of the West Virginia State Medical Association; past president of the staff of the City Hospital and a member of the staff of St. Joseph's Hospital; aged 53; died, September 4, of coronary occlusion.

Newton Whitney Wear, Bellingham, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Washington State Medical Association; county coroner; aged 52; on the staff of St. Joseph's Hospital, where he died, September 8, of leukemia.

Edmund Farnham Curry ✠ Fall River, Mass.; Harvard University Medical School, Boston, 1896; member of the New England Pediatric Society; formerly on the staff of the Fall River General Hospital; aged 58; died suddenly, October 29, in the Union Hospital, of coronary occlusion.

Leonard Reu, Buffalo; University of Buffalo School of Medicine, 1904; member of the Medical Society of the State of New York, and the American Roentgen Ray Society; aged 52; died, November 2, of miliary and pulmonary tuberculosis, chronic endocarditis and mitral insufficiency.

James Patton Taylor, Wartrace, Tenn.; Vanderbilt University School of Medicine, Nashville, 1896; member of the Tennessee State Medical Association; aged 63; was instantly killed, November 1, when the automobile in which he was driving was struck by a train.

Thomas Carr Avary, Portland, Ore.; Southern Medical College, Atlanta, 1889; member of the Oregon State Medical Society; for many years health officer of Skamania County, Wash.; aged 72; died, October 25, in the Good Samaritan Hospital, of lobar pneumonia.

Marcus F. Squier, Harrison, N. J.; College of Physicians and Surgeons in the City of New York, 1872; member of the Medical Society of New Jersey; formerly member of the board of health; aged 80; died, November 1, of angina pectoris and myocarditis.

Harlin H. Smith, Calico Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1906; member of the Arkansas Medical Society; aged 50; died, October 14, in the Baptist State Hospital, Little Rock, of cerebral hemorrhage.

Manley Arphew Siske, Kings Park, N. Y.; University of Virginia Department of Medicine, Charlottesville, 1927; senior assistant physician on the medical staff of the Kings Park State Hospital; aged 34; was accidentally drowned, October 20.

Joseph Amidee Charest, Nashua, N. H.; Tufts College Medical School, Boston, 1896; member of the New Hampshire Medical Society; on the staffs of St. Joseph's Hospital and the Nashua Memorial Hospital; aged 64; died, October 20.

Harold Lowell Reinhard ✠ Portsmouth, Ohio; Ohio State University College of Medicine, Columbus, 1927; aged 32; on the staffs of the Mercy Hospital and the Portsmouth General Hospital, where he died, November 3, of spinal meningitis.

William Baird Henderson ✠ Philipsburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1886; member of the American College of Surgeons; chief of the staff of the State Hospital; aged 71; died, October 30.

Henry Hamilton Taylor, San Saba, Texas; Memphis (Tenn.) Hospital Medical College, 1902; member of the State Medical Association of Texas; president of the school board; county health officer; aged 51; died, October 11.

Thomas Brinsley Foley, Boston; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1903; member of the Massachusetts Medical Society; aged 52; died, November 12, of carcinoma of the rectum and bladder.

William Martin Bradley, Mayesville, S. C.; Baltimore University School of Medicine, 1900; member of the South Carolina Medical Association; aged 57; died, October 28, of myocarditis following influenza and pleurisy.

Emma J. Batchelor, Cincinnati; Presbyterian Hospital and Woman's Medical College, Cincinnati, 1894; member of the Ohio State Medical Association; aged 77; died, November 4, of coronary embolism and arteriosclerosis.

Frederick John Mitchell, St. Paul; Hahnemann Medical College and Hospital, Chicago, 1903; Northwestern University Medical School, Chicago, 1909; aged 52; was accidentally shot and killed, October 18, while hunting.

William L. Cuddeback, Port Jervis, N. Y.; Bellevue Hospital Medical College, New York, 1876; member of the Medical Society of the State of New York; formerly bank president; aged 77; died, October 31.

Joseph Jackson Skelton, Huntington, W. Va.; University of Louisville (Ky.) School of Medicine, 1902; aged 67; was instantly killed, October 18, when the automobile in which he was driving was struck by a train.

Henry Howard Mason, Butler, Ala.; University of Alabama Medical Department, Mobile, 1903; member of the Medical Association of the State of Alabama; aged 58; died, October 29, of cerebral hemorrhage.

Walter Tracy Fuller, Boston; Boston University School of Medicine, 1895; member of the city health department; aged 68; died, October 29, in the City Hospital, of intestinal obstruction and chronic myocarditis.

Edward Gustine Higgins, Melrose, Wis.; Milwaukee Medical College, 1904; member of the State Medical Society of Wisconsin; aged 55; died, October 28, in Rochester, Minn., of carcinoma of the rectum.

William Hanford Todd, Dobbs Ferry, N. Y.; Medical Department of Columbia College, New York, 1890; at one time health officer of the villages of Dobbs Ferry and Irvington; aged 70; died, October 21.

James Henry Meek, Bellaire, Ohio; Ohio Medical University, Columbus, 1898; member of the Ohio State Medical Association; formerly on the staff of the City Hospital; aged 69; died, October 24.

Roy B. Leach ✠ Joliet, Ill.; Rush Medical College, Chicago, 1901; aged 55; on the staffs of St. Joseph's Hospital and the Silver Cross Hospital, where he died, November 1, of chronic myocarditis.

William August Ocker, Indianapolis; Cincinnati College of Medicine and Surgery, 1897; director of physical education in the public schools of Indianapolis; aged 61; died, November 13, of heart disease.

Wesley Van Nette, Clyde, Ohio; Northwestern Ohio Medical College, Toledo, 1890; member of the Ohio State Medical Association; aged 75; died, November 5, of a sarcoma in the left groin.

Robert Coltman, Jr., Washington, D. C.; Jefferson Medical College of Philadelphia, 1881; aged 69; died, November 3, of chronic interstitial nephritis, myocarditis and acute dilatation of the heart.

William Sherman Warren, Jacobsburg, Ohio; Starling Medical College, Columbus, 1896; member of the Ohio State Medical Association; aged 54; died, November 8, of cerebral hemorrhage.

George W. Bogart, New York; Medical Department of the University of the City of New York, 1890; member of the Medical Society of the State of New York; aged 72; died, October 31.

Oscar William Lowery, Des Moines, Iowa; College of Physicians and Surgeons, Keokuk, 1873; member of the Iowa State Medical Society; Civil War veteran; aged 86; died, October 18.

W. D. Foster, Gravette, Ark. (licensed, Arkansas, 1903); formerly mayor of Gravette and justice of the peace; aged 78; died, October 29, in Topeka, Kan., of influenza and bronchopneumonia.

William Fleming Shellhorse, Jacksonville, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1916; aged 55; died, October 30, of diabetes mellitus, carbuncle and lobar pneumonia.

Herbert Nelson Leete ✠ Twin Falls, Idaho; Rush Medical College, Chicago, 1904; aged 57; died, October 1, in the County Hospital of septicemia following a surgical infection of the hand.

Edward Pisko ✠ New York; University of Vienna Faculty of Medicine, Vienna, Austria, 1888; on the staff of the Hospital for Joint Diseases; aged 69; died, November 11, of heart disease.

Robert Wesley Frey, Trenton, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1887; member of the Kentucky State Medical Association; aged 70; died, October 10.

Miram Gardner, Cedar Falls, Iowa; University of Michigan Medical School, Ann Arbor, 1886; member of the Medical Society of the State of New York; aged 79; died, September 17.

Elinor Van Buskirk Cummins, New York; Boston University School of Medicine, 1907; University of Vienna Faculty of Medicine, Vienna, Austria, 1908; aged 53; died, October 20.

William E. Howley ✠ New York; Medical Department of the University of the City of New York, 1891; aged 65; on the staff of St. Francis Hospital, where he died, September 28.

Maxwell Lewis Volk, New York; Columbia University College of Physicians and Surgeons, New York, 1905; aged 47; died, September 18, of cerebral hemorrhage and edema.

John Douglas Simpson, Minneapolis; Chicago Medical College, 1881; an affiliate Fellow of the American Medical Association; aged 73; died, October 18, of chronic endocarditis.

Arthur Allison Howard, Boston; Harvard University Medical School, Boston, 1909; aged 52; died, October 7, in the City Hospital, of arteriosclerosis and chronic myocarditis.

Albert Lodge, Detroit; University of Michigan Homeopathic Medical School, Ann Arbor, 1879; aged 79; died, November 4, of myocarditis, uremia and interstitial nephritis.

George Edgar Mulford, Morristown, N. J.; College of Physicians and Surgeons in the City of New York, 1882; aged 76; died, November 1, of a self-inflicted bullet wound.

George William Compton, San Diego, Calif.; Denver Homeopathic College, 1898; aged 65; died, October 21, of acute dilatation of the heart and chronic myocarditis.

Benjamin F. Collins, Steubenville, Ohio; Columbus Medical College, 1892; formerly on the staff of the Ohio Valley Hospital; aged 62; died, November 8, of myocarditis.

Charles A. Isbell, Paducah, Ky.; Howard University School of Medicine, Washington, D. C., 1891; aged 66; died, June 9, in Detroit, of cerebral hemorrhage.

Flora Hubbard Ruch, Lansing, Mich.; University of Michigan Medical School, Ann Arbor, 1882; aged 80; died, November 5, in Binghamton, N. Y., of nephritis.

Herman Andrew Reque ✠ Brooklyn; Rush Medical College, Chicago, 1906; on the staff of the Norwegian Hospital; aged 57; died, November 4, of pneumonia.

Frederick James Carley ✠ North Attleboro, Mass.; Tufts College Medical School, Boston, 1906; aged 53; was found dead, November 10, with a bullet wound.

William E. Witter, Rochester, N. Y.; Chicago Homeopathic Medical College, 1890; formerly a missionary; aged 78; died, November 5, of arteriosclerosis.

Robert Victor Swanton ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1901; aged 53; died, November 5, of chronic myocarditis.

Julia Thomas, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1891; Victoria University Medical Department, Coburg, 1892; died, June 28.

Romeo Arsborne Johnston, Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1909; aged 47; died, October 11, of heart disease.

Jennie Fuller, Hartland, Maine; Boston University School of Medicine, 1882; aged 79; died, July 9, in Portland, of coronary thrombosis and myocarditis.

Gerry Elbridge Emanuel, Edgerton, Ohio; Rush Medical College, Chicago, 1884; aged 68; died, October 24, of cerebral arteriosclerosis and nephritis.

Charles Jefferson Stewart, Heiberger, Ala.; University of Alabama Medical Department, Mobile, 1891; aged 66; died, October 4, of heart disease.

James Harvey Stallard, Geuda Springs, Kan.; Barnes Medical College, St. Louis, 1901; aged 73; died, July 7, of carcinoma of the liver.

James M. Henry, Notus, Idaho; College of Physicians and Surgeons, Chicago, 1885; aged 74; died, September 21, of intestinal hemorrhage.

John B. Zabriskie, Nice, France; Long Island College Hospital, Brooklyn, 1894; aged 61; died, October 28, of cerebral thrombosis.

James Borthwick Hutton, Ceylon Station, Sask.; Queen's University Faculty of Medicine, Kingston, Ont., 1909; aged 43; died, August 2.

David Brownlee Lazier, Fraser Lake, B. C., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1901; died, August 3.

William Arthur Stenning, Sherbrooke, Que., Canada; McGill University Faculty of Medicine, Montreal, 1894; died, September 2.

Samuel Addison Marable, Palmyra, Tenn.; Vanderbilt University School of Medicine, Nashville, 1882; aged 77; died, October 30.

Richard Smith Conboy, Toronto, Ont., Canada; Medical Faculty of Trinity University, Toronto, 1903; aged 51; died, October 24.

Frank M. Boyce, Houston, Texas; Albany (N. Y.) Medical College, 1872; aged 80; died, November 2, of gangrene of the foot.

James Pickett Colvin, Lincoln, Ala.; Kentucky School of Medicine, Louisville, 1891; aged 67; died, November 1, of uremia.

David Gross, Glenwood, Iowa; Creighton University School of Medicine, Omaha, 1929; aged 26; died, November 5, of heart disease.

Granville Warburton, Brooklyn; Bellevue Hospital Medical College, 1883; aged 75; died, August 26.

Bureau of Investigation

MARCO AURELIO HERRADORA

And Some Preparations of a Specialist in "Research Regarding Therapeutics"

Marco Aurelio Herradora, according to the 1931 New York City telephone directory, is at 43 West 16th Street, telephone Chelsea 3109. At the same address and with the same telephone number is the "Spanish Biochemical Institute" and the *"Unité Pharmaceutique Française."*

Early in 1923, newspaper puffs of a syndicated article on Marco Aurelio Herradora were published, accompanied by pictures of this person and describing him as a "noted therapeutist

RISKS HIS LIFE 28 TIMES FOR SCIENCE

EXPERIMENTS WITH VIVISECTION IN HIS LABORATORY BUT

THE FINAL TEST OF A FORMULA IS MADE ON HIMSELF

Dr. Marco Aurelio Herradora

By Edward Thierry

NEW YORK, March 12.—Although he has already risked his life for science 28 times, Dr. Marco Aurelio Herradora, noted therapeutist and biochemist, expects to live to be a hundred.

For that, the scientist predicts, will soon be the normal span of life for those who fulfill these two conditions:

"Exterminate bacteria—and keep clean."

As a result of many risks in testing drug combinations in his war against bacteria, Dr. Herradora has perfected many formulas to destroy

past few years. Guinea pigs cost 90 cents each, white rats 45 cents, rabbits from $1.50 to $2, dogs $5, monkeys from $15 up.

Dr. Herradora is just 38 and a graduate of the University of Barcelona. As president of the United Latin-American Colonies Society he was chosen to deliver to New York the statute of Simon Bolivar, South American liberator, in behalf of the Latin-American nations. His greatest work has been in perfecting drug formulas for tuberculosis, pneumonia, malaria, influenza, heart disease, pellagra and high blood pressure.

Photographic reproduction (reduced) of a syndicated article on Herradora that appeared in various newspapers in 1923.

and biochemist" who expected to live to be a hundred. Herradora was described in this article as a graduate of the University of Barcelona and as president of the United Latin-American Colonies Society. The newspaper article ended with the statement:

"His greatest work has been in perfecting drug formulas for tuberculosis, pneumonia, malaria, influenza, heart disease, pellagra and high blood pressure."

In 1922, "Marco Aurelio Herradora, M.D.," was described as president of the Scientific Chemical Company of New York, which at that time put out a line of preparations for intravenous use. These products were submitted to the Council on Pharmacy and Chemistry, which after careful consideration refused to accept any of them. The Council declared that the preparations were fundamentally irrational and that the advertising matter indicated that the firm was much more interested in persuading the unthinking to use its specialties than it was

in scientific therapy. The report, which occupied nearly two pages of THE JOURNAL, appeared in the issue of April 23, 1923, after a year had been devoted to a consideration of the products.

THE JOURNAL for November 21, 1925, again reported briefly on the Herradora products and again reminded physicians that these products were unacceptable because of unwarranted and unsubstantiated statements and because of the complex and indefinite mixtures of drugs represented by the Herradora preparations.

In 1925, a questionnaire on stationery headed "Marco A. Herradora, M.D.," was sent to osteopaths, who were addressed as "Dear Doctor." One of the questions propounded to those osteopaths who received Herradora's questionnaire was whether they considered that osteopaths who had the M.D. degree, in addition to the "D.O." degree, had benefited either themselves or the osteopathic ,"profession."

In 1930, Herradora was reported as having sent a letter to a physician asking him if he would appreciate the opportunity of becoming "one of the physicians of a new Club" which he (Herradora) was helping to organize. The doctor who *would* appreciate such an opportunity would have "to contribute $1,000 as a small part toward organization expenses and equipment of the medical division."

The *Unité Pharmaceutique Française* was incorporated under the laws of Delaware, and the public has been solicited to purchase stock. The stock-selling scheme was of the familiar

SPANISH THERAPEUTIC INSTITUTE
43 West 16th Street
NEW YORK CITY, U. S. A.
SPANISH BIOCHEMICAL INSTITUTE
47 West 16th Street
NEW YORK CITY, U. S. A.

Photographic reproduction (reduced) of the letterheads of the Spanish Therapeutic Institute which later became the Spanish Biochemical Institute. This concern puts out "Vitamineralis" described as "The material from which life is created."

type—a bonus of shares of common stock to be given free to those who purchased five shares of the "7 per cent cumulative preferred at $20 a share." The *Unité Pharmaceutique Française* puts out a line of "patent medicines": "Sonedine" for rheumatism, neuralgia and gout; "Exhaline" for asthma; "Rubiline" for gallstones; "Antisol," to "aid in keeping the kidneys clean"; "Conchaline" for the sexual rejuvenation of elderly people; "Dodgeline" for tonsillitis; "Madreline" to purify the blood, and "Jenniline" for nasal catarrh and sinusitis.

Herradora is described on some of the letterheads, as "Chief Medical Research" of the "Spanish Biochemical Institute," which was earlier known as the "Spanish Therapeutic Institute" —a name which violated local laws and had to be changed. The Spanish Biochemical Institute puts out "Vitamineralis," which is said to be "the Material from Which Life is Created." According to an advertising circular:

"Vitamineralis is a combination of *sterolized minerals* similar to those entering the composition of the human body. Due to the fact that *Vitamineralis* contains *calcium, phosphorus, fluorine, potassium, sulphur, silicon, iodine, magnesium, iron, sodium, manganese, chlorine* and other minerals, it beneficially influences daily replenishment and reconstruction of the body. These minerals by renovating organic forces protect the individual constitution from decay that comes from exhaustion and diminishment of these life substances in the human economy." [Italics in the original.—ED.]

The circular then goes on to describe the "Function of Minerals" in "preserving life." The circular states that such minerals should "never be given separately, alone, but in combination with the others, *simultaneously, in adequate proportions, at the same time.*" [Italics as in original.—ED.]

The reader is then given some interesting alleged information regarding certain elements, a paragraph being given to each element. We can quote from but part of this material:

"*Fluorine* . . . When the feet and arm pits produce disagreeable odors, it will be an evidence of the need of fluorine in the system. Carbon counteracts fluorine, calcium and iron."

"*Potassium* . . . Its exhibition in the body will prevent constipation, nervous disorders, general weakness."

"*Sulphur* . . . Through its purifying qualities it clears the skin, preserving same from infection. Carbon controls sulphur."

"*Silicon* . . . 's necessary to those doing mental work. Carbon counteracts silicon."

"*Magnesium* . . . When the system is lacking in magnesium, insanity, neurasthenia and hysteria may be the consequences."

"*Iron* . . . Yes, iron will help blood forming organs but unless properly *vitaminized and sterolized* it will not be properly assimilated by the body and may also perturb the kidney function very severely. . . . It is a brain food very necessary to people doing mental work. . . . Its indiscriminate use causes stupidity, atrophia, plethora and many functional derangements such as hemorrhages and others."

"*Sodium* . . . used without due control will cause the same effect to the circulatory vessels as sea water does cause to an iron rod."

"*Manganese* . . . acting like the dark chamber of a photographic studio is the connecting element of the organism of brain matter serving as a point of contact to its dynamic emanation. It flashes thoughts as a regenerative constructive power of brain transmission . . . It helps to give stamina and determination of character."

"*Chlorine* . . . arrests the progress of muco-purulent formations and catarrh, albuminuria, obesity and protects the nervous system. Chlorine is controlled by hydrogen, nitrogen and carbon."

"*Carbon* . . . Used indiscriminately it interferes with iron assimilation, causing an acid reaction that is damaging to the teeth, bones, brain and digestion producing auto-intoxication, goitre, heart involvement and serious impairments of mental forces. When deficient it causes enduration, atrophy, eczema."

In view of the marvelous effects that are to be expected from the use of this latest addition to the field of catholicons, it is interesting to learn that "Vitamineralis is now served at the best homes of learned intelligent people and will enter the high-class soda fountains as a wholesome good habit."

A few weeks ago, an inquiry came in to the Bureau of Investigation regarding the Spanish Biochemical Institute, reading in part as follows:

> "Do you have an acquaintance with the activities of the Spanish Biochemical Institute, which is located at 47 West 16th Street, New York, N. Y.? If so, we will be very appreciative of all the facts that you can supply. The Spanish Biochemical Institute is introducing commercially a product, baptized 'Vitamineralis,' said to be 'the life substance,' which is described at length, in quaint style, in the enclosed circular. It is reported that the literature of the Spanish Biochemical Institute is now being distributed among food manufacturers and especially among carbonated beverage producers. Letters from the Spanish Biochemical Institute are usually signed by Marco A. Herradora, Director."

Our correspondent further stated that his inquiry was prompted by a letter that Herradora had written to a business concern in connection with the use of Vitamineralis, and that in his letter, Herradora had thus described himself:

> "'In regards to the writer's [Herradora's] qualifications, you will find his name listed in the enclosed booklets as a member in good standing of the Medical Association of the Greater City of New York, affiliated with the Academy of Medicine, also as the Chairman of the Hospital Committee of the International Association of Physicians, Surgeons and Dentists, member in good standing of the Yorkville Medical Society. This in no way should be construed as the writer doing clinical medical work, but exclusively devoted to medical research. . . . The undersigned, who has devoted more than twenty years of study and research to subjects of this nature, is prepared to furnish to you unquestionable references as to his integrity and scientific standing.'"

Herradora's claim, that he is a member in good standing of the Medical Association of the Greater City of New York, astonishing as it may seem, is correct. This in spite of the fact that that organization has been advised of Herradora's past and present activities in the nostrum field and has been sent a photostatic copy of a letter from the Rector of the University of Barcelona, who, in response to an inquiry from the American Medical Association, declared definitely that no man by the name of Marco Aurelio Herradora was a graduate in medicine of the University of Barcelona.

In January, 1931, Herradora was brought into court on the charge of unlawfully practicing medicine. Evidence was submitted by an investigator for the State Department of Education of New York that Herradora examined her, gave an alleged diagnosis, and prescribed a bottle of Sonedine, one of the "patent medicines" put out by the *Unité Pharmaceutique Française*. Herradora testified, on the other hand, that he made no examination or diagnosis, but merely sold the woman a bottle of Sonedine. His testimony was supported by that of two of the employees. After hearing all the evidence, which was given before three justices—Walling, Voorhees and Direnzo—the verdict was:

"A majority [two out of three] of the court has a doubt and the defendant is acquitted. Mr. Justice Voorhees dissents."

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BACTERIAL ENDOCARDITIS

To the Editor:—When a girl, who is now 12, was 3 years of age, her mother was told that the child had a heart murmur. At the age of 9, the tonsils were removed. The patient has never had a definite attack of rheumatic fever but has had indefinite pains in the joints. The past history otherwise is negative. About the middle of July, 1931, the patient was caught in a severe electrical storm about half a mile from her home. Being frightened, she ran as fast as she could to her home. From that time until I saw her, she became listless and pale. When I saw her, Aug. 6, 1931, she was a well nourished, well formed child, up and around the house. She had a temperature of 101, a pulse of 130 and a loud systolic murmur at the apex. She was decidedly anemic. There was a definite moderate enlargement of the right side of the heart. I made a diagnosis of an acute attack of chronic endocarditis, with acute dilatation probably induced by the exertion. I put her to bed, gave her salicylates with alkali, plenty of sugar, citrus drinks and water. I started her on iron and gave bromides at night. An ice cap over the heart quieted the uneasy pain present there. About ten days after this, I noticed a new murmur, systolic, over the aortic area. Since the onset, the temperature has been decidedly septic, at times returning to normal. Small ecchymotic areas have developed all over the abdomen and the upper portion of the chest. The spleen is now definitely enlarged and tender. The liver margin is not enlarged but is somewhat tender. At first, the patient was nervous and subject to trembling, but now she has attacks of moderate stupor. The urine contains some albumin and numerous bacteria. I had an internist see her, and he suggested small doses of digitalis and liver extract. He would give me no prognosis. The picture now is one of much discouragement. The pulse stays rapid but regular. The patient does not have any edema of the extremities but does have transient indefinite puffiness of the face. The temperature shows no intent to return to normal. There is no blueness of the lips, cheeks or fingernails, but the anemia is not getting any better; in fact, it appears worse. The patient is losing some weight despite my attempts at a nourishing diet. The bowels are regular, but the appetite is poor. The parents, who are of limited means, are naturally much worried over the course of this attack. I realize that these cases sometimes take months to show recovery, even with absolute bed rest. Will you please tell me of anything else that I can do? Do you think this child will recover? If you do, to what extent do you think that her heart will be permanently crippled? Have you any idea as to how long this acute septic process with fever is going to last? She has had some moderate pains in the joints and swelling since I have been seeing her. The murmurs are loud and distinct. When the temperature goes down to near normal, the pulse gets much weaker and the child more stuporous. Please omit name.

M.D., New York.

ANSWER.—The history and observations as given are indicative of a bacterial endocarditis which is probably more than subacute. From the evidence there can be little doubt in regard to the diagnosis. The overexertion probably had little to do with the onset. The enlargement of the heart is due to infection and not to dilatation from overexertion. About three fourths of such cases occur in patients who have previously had rheumatic fever, and in this case the history of definite pains in the joints is probably indicative of rheumatic infection at that time. Becoming wet and chilled at the time of the storm might have predisposed to an infection of the upper respiratory tract, which later localized itself in an already damaged heart.

The prognosis is practically hopeless. There are cases of subacute bacterial endocarditis in which recovery is made, but these constitute a small percentage, and they are usually the milder forms. In the cases in which the observations are as they are here, the mortality is 100 per cent.

No medicine or treatment known at present will have any effect on the progress of the disease. There is no treatment except absolute rest in bed, and quiet, and time. All that can be done is to make the patient as comfortable as possible and to employ symptomatic treatment if this is necessary. There is no especial reason for the digitalis and it is doubtful whether the liver extract is of any value.

There is no possible way of giving an estimate as to how long this will continue. The symptoms in the joints are moderately frequent in subacute bacterial endocarditis.

DIAGNOSIS AND TREATMENT OF SYPHILIS

To the Editor:—A woman, aged 22, was found about three years ago in the course of exhaustive examinations to determine the cause of a marked nervousness to have a 3+ Wassermann reaction, and her mother recalled that as an infant under the care of a colored nurse girl she had developed skin manifestations which probably were secondaries. Treatment carried out to cure her syphilis since the positive Wassermann has failed to change the reaction. She recalls no recurrences of active early lesions of syphilis, and is apparently perfectly well. Will you please answer the following: Should further treatment be persisted in? If so, what other than the arsenicals and mercury? What can I tell the patient about her 3+ Wassermann reaction? Is she infectious? Can she marry without running the danger of transmission of the infection? In taking her blood for a Wassermann test, am I running the chance of an infection? Should a case of this type, without any signs of lesions or ill health and with only the 3+ Wassermann, be reported as a case of syphilis, to be put under the same supervision and precautionary instructions that the health department insists on in active syphilis? Please omit name.

M.D., New York.

ANSWER.—The history of this young woman is not covered in sufficient detail in the inquiry to permit an intelligent answer to the question. No examination of the family and no account of evidence bearing on the question of prenatal rather than postnatal infection is given. The skin manifestations appearing in infancy need have had no connection with the colored nurse girl. The mother of the patient in particular and the family at large, including siblings, should be studied to determine whether or not this young woman is the victim of a prenatal infection. If she is, the indications for treatment, the prognosis and decisions with reference to marriage, children and public health reporting and management differ entirely from those in what might be an early acquired case. Persistent and irreversible positive blood Wassermann reactions are known to occur both in early cases of acquired infection in which the patient has lived through to adult life practically without treatment and unaware of the presence of the disease as well as in prenatal infection unrecognized until the later years. If the infection is postnatal, an examination of the spinal fluid, which is not mentioned in the inquiry, is a necessary part of the determination of the status of the patient.

Granted that the infection was acquired in infancy or was prenatal, it is highly improbable that the patient is in the least infectious and there is therefore no reason for exercising the authority of the public health officials for the prevention of the infection of others. The question as given contains no account of previous treatment and therefore it is impossible to advise on further treatment. What is really required in the management of a case such as this is familiarity with the general principles of modern syphilology on the basis of which all the questions asked and a number of those which should be asked but on which the questioner provides no information could be easily answered.

APOPLEXY WITH FEVER AND LEUKOCYTOSIS

To the Editor:—A corpulent old lady had some rather vague abdominal symptoms and at the same time developed gradually, without loss of consciousness, a partial hemiplegia. During the three days that this was going on, she had a fever of 101 to 103.5 F. and a leukocytosis which reached 22,000 with 92 per cent polymorphonuclears. The question which arose, and which I wish to ask you, is this: Could this blood picture have been caused by a simple apoplexy? There was no reason to suspect encephalitis or septic emboli. It was more like thrombotic softening. I understand that such conditions can cause fever, but can they cause a leukocytosis of 22,000, or any leukocytosis? Please omit name.

M.D., Missouri.

ANSWER.—Cerebral hemorrhage frequently causes fever and leukocytosis and may have been the underlying factor in the patient mentioned. Obesity is often associated with atherosclerosis in elderly patients and could be a predisposing factor.

Less likely is a cerebral embolus from a mural thrombus, which may have become separated from the auricular wall or auricular appendage. It is not necessary for such an embolus to be infected in order to produce fever and leukocytosis, as it is known that the sterile product of the resulting cerebral injury may cause similar manifestations.

ALOPECIA, EXFOLIATIVE DERMATITIS AND SYPHILIS

To the Editor:—I have a patient who came to me with a skin condition which I diagnosed as exfoliative dermatitis based on a history of treatment for syphilis. In addition to the dermatitis he has completely lost the hair of the scalp, face, eyebrows and lids. This condition is of about eight weeks' duration. I should like to be advised as to whether or not there is any chance of stimulating a new growth; also the procedure. When the patient first came to me, seven weeks ago, I gave him daily for fourteen days intravenous injections of sodium thiosulphate, and other treatment was symptomatic. What should the antisyphilitic treatment be in this case? Please omit name.

M.D., Illinois.

ANSWER.—The alopecia accompanying exfoliative dermatitis as described in this patient may be an alopecia totalis, coincidental with, or associated with, the intoxication process that brought on the dermatitis. If such is the case, the outlook for at least a temporary recovery of hair spontaneously as the dermatitic process clears up and the patient regains normal health is fairly good. It is impossible, however, to offer any assurance that the hair will not be again completely lost without any necessary association with the dermatitis. The correspondent does not give sufficient detail to judge whether the exfoliative dermatitis is actually a result of treatment for syphilis or whether the patient may not even present the exfoliative process with thinning or relative absence of the hair that is occasionally observed in the so-called ichthyosiform erythroderma. This matter, however, is a congenital affair and could hardly be confused with the picture described.

Stimulation of a new growth of hair may be to some extent aided by vigorous exposure of the scalp to the quartz mercury vapor lamp. It is inadvisable in view of the exfoliative dermatitis to use local irritants which constitute the next alternative. With reference to further antisyphilitic treatment, it is impossible to base any decision on the facts given by the correspondent as there are no particulars with reference to the stage and character of the syphilitic infection, or of the previous treatment. It may at least be said, however, that a careful patch testing of the patient for sensitivity to the arsphenamines should be conducted by some one familiar with this type of work, and that if such patch testing reveals a specific sensitivity to the arsphenamines these drugs at least should be permanently debarred from the therapeutic regimen.

CONSTIPATION IN A BREAST FED BABY

To the Editor:—Will you kindly inform me as to how to treat constipation in a breast fed baby? The child is 5 months old, weighs 13 pounds and 12 ounces (6 Kg.), and appears to be perfectly normal otherwise, except for a persistent and almost intractable constipation. Rectal examination gives negative results. The child apparently does not have any pains or cramps that would lead one to suspect a chronic obstruction. Some suggestion as to treatment would be greatly appreciated. Please omit name.

M.D., South Dakota.

ANSWER.—Constipation in a breast fed baby is a different thing from constipation in a bottle fed baby. In the latter, the movements are often hard; in the breast fed baby they are never so. The treatment, therefore, is different. Commonly, constipation in the breast fed baby is due to the fact that the child is not getting enough food and, if an ample supply of milk, cereals, vegetable purées and orange juice is given, the condition will commonly remedy itself. If it does not, there is no objection to the use of a nonirritating suppository, such as one made of gluten or soap covered with oil or petrolatum. If the constipation still persists in spite of the additional food, there is no objection to giving liquid petrolatum or magnesia magma daily up to the necessary amount.

In the purely breast fed baby there is no objection to letting the baby go two, or sometimes even three, days before it has a movement. That there is no mechanical obstruction in this case is evident from the lack of pain or "cramps" and abdominal distention.

TYMPANITES

To the Editor:—Could you refer me to a source of information on tympanites? I have a patient, aged 50, with a history of chronic constipation for years, and pain in the lower left quadrant, with a spastic colitis. With rest, hot packs, diluted hydrochloric acid, atropine, bacillus acidophilus milk and lactose, and a bulky diet and oil enemas, the stools are fairly well formed and the spastic colon is improved. However, even after an adequate evacuation, he is troubled with gas. I am under the impression that the putrefaction of protein causes this tympanites, but a restricted protein intake has been of no benefit. Could you suggest a further means of therapy? Please omit name.

M.D., Nebraska.

ANSWER.—Tympanites is ordinarily considered a chronic accumulation of gases in the intestinal canal. Briefly, the gases may originate from exogenous causes, such as aerophagy in nervous individuals or in rapid eaters, or from endogenous sources, principally the result of the action of bacteria on proteins, carbohydrate and fats. Impeded expulsion of gases, even though the quantity may be normal, can occur with any form of chronic constipation, and in every case a cause for intestinal stenosis must be sought. Cardiac decompensation and general arteriosclerosis are further causes.

In regard to treatment, the etiologic agent should be sought and treated if found. Changes in the constituents of the diet are recommended, such as low protein, low fat or low carbohydrate. Of the latter, rye bread, vegetables rich in cellulose, and potatoes are particularly harmful. Dietary changes depend on whether putrefaction or fermentation are the causes of the gas. Medicinal measures, aside from hydrochloric acid, atropine or atropine-like substances, physostigmine and pituitary solution, have been shown to be of little avail. Colon irrigations with various antiseptic substances have been successful.

DILATED VESSELS IN VAGINA FOLLOWING RADIUM TREATMENT

To the Editor:—I have a patient who had radium treatment for uterine fibroids and an amputation of the cervix five years ago. Since that time she has complained of tenderness and pain in the pelvis and extreme sensitiveness throughout the birth canal. She is unable to have intercourse on account of the pain. A vaginal examination is practically impossible. The vulva and the vagina are both covered with enlarged venules. There are no palpable enlargements in the pelvis and no discharge to speak of. Twenty years ago she had both breasts removed for suspicious malignancy. She is 49 years old. She has not menstruated for three years. Can you tell me whether the hypersensitiveness is the result of radium treatment? Can you suggest any treatment in this case? Kindly omit name.

M.D., Michigan.

ANSWER.—The condition of dilated vessels of the vagina and vulva is not common following radiotherapy, though the close time relationship is suggestive in this case.

The sequelae that are due to irradiation are dependent largely on the dosage, filtration and the age of the patient and are the result of varying amounts of cell and tissue destruction with resultant scar formation if and when healing occurs. Any or all tissues within the radius of activity of the radium may be involved. The cicatricial contraction that may result could cause circulatory obstruction with dilatation of the terminal vessels. These tissue changes following the use of radium are not infrequently associated with pain and tenderness as well as narrowing of the vaginal lumen, especially in those cases in which the vagina has been exposed to the effect of the radium.

It is also possible that there may be some interference with uterine and vaginal drainage as the result of scar formation following the cervical operation or the radium treatment.

It would seem necessary to determine even under anesthesia whether or not there are any strictures of the vagina or cervix which are making difficulty. If there are they should be carefully dilated, or, if this cannot be accomplished, other necessary steps should be taken.

The condition might of course be something that is entirely unrelated to either the operation or the radium treatment.

POLIOMYELITIS AND PREGNANCY

To the Editor:—I should like to gain information regarding a case of poliomyelitis in a woman, aged 20, with a pregnancy of six months' duration. At the end of the third day the patient has no paralysis. She received 20 cc. of convalescent serum the first day and 15 cc. the second. Does the combination with pregnancy change the ordinary picture of the disease concerning the mother and what can be expected in the baby if the pregnancy terminates normally? Will there be any paralysis in the child, if the mother does or does not have paralysis?

C. J. LOHMANN, M.D., Burlington, Iowa.

ANSWER.—Although there are no statistics available on the occurrence of poliomyelitis during pregnancy, some observers have the impression that the disease occurs in the later months of pregnancy more often than would be expected if it were only a chance coincidence. If this proves to be the case, it would suggest that some physiologic alteration during pregnancy may affect susceptibility to infection with poliomyelitis.

Paralysis of certain muscle groups may necessitate instrumental aid in delivery. However, some of the observed cases, even with extensive paralysis, have terminated in normal delivery of a normal child. In one instance in which delivery took place while the mother was in the acute stage of poliomyelitis, the child is said to have developed the disease after birth; but it is not clear whether infection was contracted in utero or after birth.

The Harvard Infantile Paralysis Commission is studying this question and would be glad to have reports of any such cases.

TREATMENT OF FLATFOOT

To the Editor:—I have a patient, aged 2 years, who has an extreme degree of flatfoot or relaxed arch, depending on the different classifications. This child objects to going barefooted owing to the discomfort. The child is not overweight and has walked since the age of 16 months. Please advise as to the proper treatment and expected prognosis of the condition. Please omit name.

M.D., Kansas.

ANSWER.—If the child has an extreme degree of flatfoot, the best treatment is a series of plaster-of-paris casts, maintaining varus position of the posterior half of the foot and valgus position of the anterior portion of the foot; i. e., the heel is tilted toward the outer border and the sole toward the inner border. These casts should be applied by one thoroughly trained in orthopedic work, or harm can be done. They should be changed once in three weeks, and the child should be encouraged to walk after the cast is 24 hours old.

After a number of casts, which varies from one pair to three or four pairs, the child should be fitted with the proper shoes: rigid shank, high-laced shoes, well fitted around the ankle, with a straight inner borderline and round toe. The heel of this shoe should be three-fourths inch longer on the inner border than on the outer. It should be three-sixteenths inch higher on the inner border. The outer border of the sole should be one-eighth inch higher than the inner. Felt pads should be put into the shoes to support the longitudinal arches.

If the child continues to walk with pronation, the uppers of the shoe should be reinforced by leather molded or cut over the malleoli. The child should walk on the outer borders of his feet. Any textbook of exercise provides suitable exercises for improving the longitudinal arch.

EPIDERMOLYSIS BULLOSA

To the Editor:—A man, aged 31, slightly overweight but otherwise in perfect health, for about fifteen years has been troubled with blisters on his feet after any unusual exertion, such as playing golf, excessive walking, or dancing. They appear the morning after one of these forms of exercise and have the appearance of ordinary bullae, sometimes filled with clear fluid and less often with blood. They do not itch, are as painful as the average bullae, and keep the patient off his feet about two days during the height of the attack. They take the usual length of time for a bulla to heal and then reappear after the next exertion. He has had treatment from dermatologists, chiropodists and internists, all without relief. He has worn every type of shoe on the market, from the softest to the hardest made, and also shoes made in a special form to prevent irritation. The lesions are confined to the feet and do not appear in any other part of the body. The urine is normal. Can you suggest a diagnosis, the proper procedures to follow, and treatments? Please omit name and address.

M.D., New York.

ANSWER.—The most likely disorder in which bullae occur following slight trauma is epidermolysis bullosa. If the patient has this, it will be difficult to use treatment that will be of much service.

The cause of epidermolysis bullosa is unknown. A diminution in the amount of elastic tissue in the skin has been described by Engman and confirmed by others. Many suggestions have been made, but no conclusive observations have been recorded.

The prevention of injury, together with treatment of the symptoms as they arise, is all that can be recommended. Arsenic compounds and other specific cutaneous agents have not had any effect on the progress of the disease.

REMOVAL OF FLOWERS FROM HOSPITAL ROOMS AT NIGHT

To the Editor:—It seems to be a universal practice in hospitals to remove vases of flowers from a sickroom for the night. Plants liberate oxygen, as we all know, when growing in soil. Why should flowers in a vase be removed? One hospital superintendent stated that she was taught that the process is reversed: that carbon dioxide is liberated.

R. J. STEIN, M.D., Graceville, Minn.

ANSWER.—It is difficult to give any definite reason why the removal of flowers from the sickroom at night has become an institutional routine. The statement of one hospital superintendent that carbon dioxide is liberated is apparently not correct. Living plants absorb carbon dioxide and give off oxygen. It is doubtful whether cut flowers do this to an appreciable extent; and even if the cut flowers did decay, the amount of carbon dioxide liberated would have practically no effect on the ratio of carbon dioxide to oxygen in the air of the room. Generally the flowers are removed to a warmer room at night rather than to a cooler room, so that preservation of the flowers is not an argument. Furthermore, if the odor of flowers is bad for the patient at night, it would seem logical to assume that it would also be bad for the patient in the daytime.

The inquiry was also referred to an authority on hospitals, who replies: "There is a certain psychologic effect on the patient in seeing flowers wither and there is a beneficial psychological reaction in most instances when, after a night's rest, fresh flowers, or flowers that are apparently fresh, are brought into the room to lend a little color to the patient's surroundings. . . . The procedure of removing flowers from the patients' rooms at night and returning them in the morning is a rather beneficial one, from the patients' standpoint."

IDIOSYNCRASY TO GOLD SODIUM THIOSULPHATE

To the Editor:—Information is requested as to the treatment of severe enteritis, manifested by diarrhea and abdominal cramps, following a series of injections of gold sodium thiosulphate, given for lupus erythematosus. The patient showed marked idiosyncrasy to 25 mg. intravenous doses, manifested by swelling about the eyes and neck, by dizziness and other signs. The skin lesions have cleared nicely, but the patient now has an intractable and typical heavy metal enteritis. Is sodium thiosulphate useful in combating this?

M.D., California.

ANSWER.—Most observers are not impressed with the efficacy of sodium thiosulphate as used in combating the toxic manifestations associated with injections of gold sodium thiosulphate. It would seem that enteritis ostensibly following the administration of a metal should be dealt with in this way plus the administration of calcium intramuscularly as the gluconate, for example, and by the use of appropriate measures, such as a non-residue containing diet, an insoluble bismuth compound such as the subcarbonate, and charcoal in 4 Gm. doses by mouth, rest in bed, and teaspoonful doses of camphorated tincture of opium at appropriate intervals. The complications of gold administration are more difficult to deal with than those of mercury or bismuth, and apparently involve a higher degree of idiosyncrasy on the part of the patient, and a slower or more difficult elimination of the injurious agent. It would be well to recall that not all enteritis which follows administration of a heavy metal is necessarily due to the drug as such, and careful stool examination would certainly be in order.

POISONING OR MENINGITIS

To the Editor:—Two children, aged 4 and 5 years, from the same family, showed the clincal picture of cerebrospinal meningitis. Spinal puncture was done on one of these children shortly before death, and the fluid showed a marked increase in pressure with slight cloudiness. Both children died within twelve hours after the first symptoms appeared. Is there a poison that would take effect with such suddenness and with the symptoms of meningitis? The laboratory report on the spinal fluid was unsatisfactory, except for the statement that there was contamination, with many bacilli and cocci. Please omit name.

M.D., Montana.

ANSWER.—There is such a thing as a cerebrospinal type of arsenical poisoning which might produce symptoms suggestive of meningitis, followed by speedy death. The convulsant poisons, such as strychnine, brucine, santonine and aspidium, might also produce clinical pictures simulating meningitis. A well marked turbidity of the cerebrospinal fluid would be in favor of an infection rather than of poisoning, as would also the presence of many bacilli and cocci.

DIPHTHERIA IMMUNIZATION

To the Editor:—A child, aged 7 years, was given 10,000 units of diphtheria vaccine because of a membrane appearing on the tonsils. A swab was sent to the laboratory and a return reported negative for evidence of diphtheria. The parents now desire to have the child immunized against diphtheria. Is there any reason why this should not be done? Please omit name.

M.D., Kansas.

ANSWER.—Presumably the child received 10,000 units of diphtheria antitoxin (not vaccine). If the Schick test is positive, indicating that the child is susceptible to diphtheria, there is no reason why it should not be immunized. For immunization, diphtheria toxoid should be used in preference to diphtheria toxin-antitoxin, not only because it is more efficacious but because this child has already had an injection of horse serum.

PATERNITY TESTS

To the Editor:—Will you please tell me the best method, if any, to determine whether a child, 1 month old, of a white mother has a Negro father? Is there any blood test that would assist in making this determination? Kindly omit name.

M.D., Georgia.

ANSWER.—At the age of 1 month, the child of a white mother and a Negro father may not show any obvious, clear-cut Negro characteristics. There is no blood test that will reveal the race of either parent. The most that the available blood test can show is that a given man may have been the father of a given child or that he could not have been the father.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 11. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Clinical.* Chicago, Dec. 29. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Boston, Dec. 21. Sec., Dr. Wm. H. Wilder, 122 S. Michigan Blvd., Chicago.

ARIZONA: Phoenix, Jan. 5-6. Sec., Dr. B. M. Berger, 12 North Central Ave., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, Dec. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Jan. 5. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 29-30. *Regular.* Washington, Jan. 11. Sec., Dr. W. C. Fowler, District Bldg., Washington.

HAWAII: Honolulu, Jan. 11-14. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu.

LOUISIANA: New Orleans, Dec. 10-12. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Homeopathic.* Dec. 17-18. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Jan. 19-21. Sec., Dr. E. J. Engberg, 524 Lowry Medical Arts Bldg., St. Paul.

NEBRASKA: *Basic Science.* Lincoln, Jan. 12-13. Act. Sec., Mr. P. H. Bartholomew, Lincoln.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, Grand Forks.

OREGON: Portland, Jan. 5-7. Sec., Dr. C. J. McCusker, 1014 Medical Dental Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 5-9. Sec., Mr. Charles D. Koch, Harrisburg.

RHODE ISLAND: Providence, Jan. 7-8. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: The St. Charles Hotel, Pierre, Jan. 19-20. Dir., Dr. H. R. Kenaston, Bonesteel.

TENNESSEE: Memphis, Dec. 18-19. Sec., Dr. Alfred B. DeLoach, Medical Arts Bldg., Memphis.

WASHINGTON: *Basic Science.* Seattle, Jan. 14-15. *Regular.* Seattle, Jan. 18-19. Dir., Mr. Charles Maybury, Olympia.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 19. Sec., Prof. Robert N. Bauer, 3414 West Wisconsin Ave., Milwaukee. *Regular.* Madison, Jan. 12-14. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., LaCrosse.

Oregon July Examination

Dr. C. J. McCusker, secretary, Oregon State Board of Medical Examiners, reports the written examination held at Portland, July 7-9, 1931. The examination covered 11 subjects. An average of 75 per cent was required to pass. Thirty-five candidates were examined, 34 of whom passed and one failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1931)	88.1, 88.4, 89.8
State University of Iowa College of Medicine		(1930)	81.2
University of Michigan Medical School		(1930)	90.4
Creighton University School of Medicine		(1930)	88.1
University of Nebraska College of Medicine		(1931)	83.5
University of Oregon Medical School		(1928)	86,
	(1930) 87.1, 88.3, 89.1, (1931) 81.2, 81.4, 81.8, 83.1, 83.6, 83.7, 84.4, 85.5, 86.2, 86.5, 86.6, 86.6, 86.7, 87.2, 87.6, 87.6, 88.4, 89.5, 91, 92.1, 93		
Osteopaths			81.9, 83.6
	FAILED		
Osteopath *			

Dr. McCusker also reports 8 physicians licensed by reciprocity with other states and 3 physicians licensed by endorsement from July 8 to Sept. 8, 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Denver and Gross College of Medicine, Colorado		(1909)	Colorado
Atlanta School of Medicine, Georgia		(1908)	Georgia
State University of Iowa College of Medicine		(1929)	Iowa
University Medical College of Kansas City, Missouri		(1906)	Kansas
Washington University School of Medicine		(1928)	Missouri
University of Nebraska College of Medicine		(1923)	Nebraska
University of Oregon Medical School		(1929)	California, Indiana

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1925)	N. B. M. Ex.
University of Oregon Medical School		(1930, 2)	N. B. M. Ex.

* Reexamined in four subjects. Failed in three.

Nevada Reciprocity Report

Dr. Edward E. Hamer, secretary, Navada State Board of Medical Examiners, reports 7 physicians licensed by reciprocity with other states and 2 physicians licensed by the endorsement of credentials from June 13 to Aug. 3, 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Cooper Medical College, San Francisco		(1907)	California
Hahnemann Med. Coll. of the Pacific, San Francisco		(1914)	Washington
University of Louisville Medical Department		(1915)	Montana
Baltimore Medical College		(1895)	Penna.
University of Nebraska College of Medicine		(1925)	Nebraska
Memphis Hospital Medical College		(1910)	Mississippi
Licentiate of the Royal College of Physicians and the Royal College of Surgeons of Ireland		(1908)	California

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
Columbia University College of Phys. and Surgs.		(1929)	N. B. M. Ex.
University of Toronto Faculty of Medicine		(1927)	N. B. M. Ex.

Book Notices

Motives and Mechanisms of the Mind: An Introduction to Psychopathology and Applied Psychology. By E. Graham Howe, M.B., B.S., D.P.M., Honorary Physician, Tavistock Square Clinic for Functional Nervous Disorders. Cloth. Price, 10s. 6d. Pp. 260. London: The Lancet, Ltd., 1931.

The twelve chapters of this book have appeared in serial form in the *Lancet*. The book is refreshing as a synthesis of the approach toward the patient of that venerable and vanishing figure in medicine, the family physician, and of the modern psychotherapeutist imbued with dynamic concepts of human motivation. Perhaps the key-note of the volume is struck, properly, in the quotation from Ecclesiasticus on the fly-leaf, "He that sinneth before his Maker, let him fall into the hands of the physician." Modestly disclaiming anything "more than a little originality save in certain details of exposition," Dr. Howe presents a clinician's digest of the material of modern psychopathology, gleaned primarily from the field of psychoanalysis. The language is rather pictorial, to borrow a term from the author, and diagrams are used freely in the exposition of his conception of emotional development and to portray such mechanisms as projection, ambivalence, and symptom formation as solution of conflict.

The author makes an earnest attempt to summarize and to classify his material as he proceeds. His method of exposition may be illustrated by a quotation from the summary of his chapter on "Love: The Rôle of the Mother":

> It is the unconscious attempt to find short cuts [for solution of the Oedipus situation] which provides the material of psychopathology, and the symptoms of the disordered mind.
>
> The first short cut, described as "fixation compromise," is an attempt to have the best of worlds, which very nearly succeeds, but it is at the expense of dissociation, conflict and phantasy. . . . The second short cut method is by emotional repression, which may give rise to sexual negativism (frigidity), a reversal of the feeling tone from love to hate (as occurs in the misogynist) or to the pseudo-intellectualism which is the psychopathology of the "high-brow." . . . The third short cut is found in the psychology of the prig. . . . This is an example of overcompensation and, as a reaction to the problems of the eternal triangle, may be described as "Messianic identification."

Brief synopses of case histories are used liberally by way of demonstration.

The arrangement of material is confusing. If the book is to be regarded as an introduction to psychopathology, it would appear that clearer definition of the terms and concepts utilized throughout the book should be achieved early. As a simple example, one finds "repression" first referred to on page 29, with the statement that suppression "is not to be confused with repression, which is an unconscious and automatic process." Next "repressed homosexuality" is discussed (page 87). On page 120, reference is made to "repression of the sex factor" in calf-love, and there is a short, incomplete section on repression (page 125). On page 188, repression is discussed in one paragraph as one of six listed defense mechanisms. Unfortunately, a typographic error in which the term suppression is used instead of repression confuses the meaning for the uninitiated. Finally, in a section on conflicting wishes (page 211), "conscious suppression" and "unconscious repression" are cited as the two methods of resolving conflict. An initial adequate

discussion of repression (never actually achieved in the book) and of other mechanisms would add much to the clarity of the text, for the student.

The final chapter, "Psychopathology in Relation to Treatment," reveals a healthy skepticism as to efficacy of treatment procedures in vogue among medical men, together with an attempt at constructive criticism. "Perhaps it is inevitable that the practice of psychotherapy should always fall short of the preaching of psychopathology, but it is probable that the next few years may see a great advance in our present method of healing." The author recommends "modified analytic methods" of treatment for the "average patient." "The analytic approach to mental disorders is the aetiological pursuit of causative factors into the past, the childish and the primitive. Any such approach to the problems of the human mind must necessarily be analytic but it is nevertheless not to be confused with psychoanalysis. Psychoanalysis means 'Freud,' and assumes both a specific psychopathology and a definite therapeutic technique. The latter, though invaluable for research work, can never be suitable for ninety-nine per cent of patients who require treatment, because of the time and cost which such treatment involves." The "analytic method" of choice is not very clearly described, but it is suggested that "whatever analytic method we may adopt there are certain common factors which demand consideration, the most important of which are transference, resistance, and free association."

The book is a laudable attempt to present the material of psychopathology to medical men. Uninitiated medical students will doubtless find it confusing. The psychoanalyst will find it incomplete. The practitioner in medicine will find it informative and stimulating, but it would be unfortunate were he to attempt to base his technic of treatment exclusively on the expositions and suggestions offered.

Benzol (Benzene) Poisoning: A New Investigation of the Toxicity of Benzene and Benzene Impurities. By Carey P. McCord, M.D., in collaboration with Nora Cox and Charlotte O'Boyle of the Industrial Health Conservancy Laboratories, Cincinnati, Ohio. Paper. Pp. 78, with 10 illustrations. Cincinnati: Industrial Health Conservancy Laboratories, 1931.

Benzene poisoning has become one of the most serious hazards of modern industry. As pointed out in the preface to this report, conditions other than benzene poisoning simulate it so closely that the diagnosis is frequently confused. Indeed, recently the similarity of benzene poisoning to agranulocytosis has been a special problem. The part played in the production of pathologic conditions by impurities in benzene has not been adequately presented, and the range of symptoms has not been properly recorded. The review of the subject by Dr. McCord presents new evidence, provides a practical review of present knowledge, and affords orientation in this field. It includes much new experimental evidence and is exceedingly practical in its recommendations for treatment and particularly for prevention. Finally, it is supplemented by an excellent bibliography covering the literature on the subject.

Lehrbuch der inneren Medizin. Bände I und II. Von G. v. Bergmann (mit F. Stroebe), R. Doerr, H. Eppinger, usw. Paper. Price, 45 marks. per set of two volumes. Pp. 893, with 136 illustrations. Pp. 782, with 140 illustrations. Berlin: Julius Springer, 1931.

As evident from the list of authors, a galaxy of stars of first and second magnitude among the medical teachers and investigators of Germany, this is a cooperative enterprise yielding a thoroughgoing textbook. Siebeck's introduction alone on the "physician and his function" makes one wish either that this book were in the hands of American medical students or that a similar introduction were found in our textbooks on the practice of medicine. "Not erudition but real help is demanded by the patient." Almost every section of the book commences with a general introduction intended to connect the student's preliminary work in physiology, pathology and bacteriology with the special pathology and therapy of the disease group under discussion. For instance, instead of precipitating the student unceremoniously into the study of "typhoid fever," as is done in so many of our textbooks on medicine, a chapter on the general mechanism of infection (by Doerr) and on general therapy of infection (by Staehelin) precedes. Helpful views, schematic illustrations, photographs of typical patients, and reproductions of characteristic roentgenograms are liberally sprinkled throughout the book, all of which aid the forcefulness of the presentation. Particularly interesting is the chapter by Siebeck on neuroses. One gets the impression that therapy is dealt with in quite a practical manner and that psychotherapy especially is given more adequate consideration than is generally the case in books of this kind; and the final portion of fifty pages on general therapy by Lichtwitz gives the much to be desired finishing touch to the book, the emphasis on treatment at the beginning and the end of the course yielding the impression that therapy is the alpha and omega of medicine. One fault that may be found—if criticism there must be in a book review — is the almost pedantic characteristically German thoroughness displayed in most of the chapters, which would discourage many medical students not accustomed to such heavy mental pabulum. To medical teachers this book may be strongly recommended as an example of the aims of modern German medical instruction.

The Biology of the Amphibia. By G. Kingsley Noble, Ph.D., Curator of Herpetology and Experimental Biology, the American Museum of Natural History. Cloth. Price, $5. Pp. 577, with 175 illustrations. New York and London: McGraw-Hill Book Company, Inc., 1931.

This scholarly treatise is somewhat more than the title might indicate. It is a general discussion of modern biologic problems, Amphibia being used as illustrative material. In interesting and, so far as possible, nontechnical language, Dr. Noble deals with the following problems: the origin of the amphibia, in which one finds illustrated modern phylogenetic methods; development and heredity, including normal and experimental embryology and genetics; the mode of life history, largely a discussion of larval adaptations; speciation and adaptation, a discussion of modes of evolution; sex and secondary sex characters. Then follow a series of chapters on comparative anatomy and physiology, system by system; a chapter on instinct and intelligence; one on the ways of amphibia; one on ecology; one on geographic distribution and economic value; and, finally, one on relationships and classification. The book is so broadly conceived that it might readily be used as a textbook of vertebrate biology for senior college or graduate students. Few important problems of modern biology escape notice. Most interesting are the chapters on speciation and adaptation, sex and secondary characters, the endocrine glands, instinct and intelligence, and relationships and classification. The whole book, however, is of such even excellence that it is difficult to select its best features.

Clinique médicale des enfants: Affections des organes hemo-lymphopoïétiques et du sang. Par P. Nobécourt, professeur de clinique médicale des enfants à la Faculté de médecine de Paris. Paper. Price, 60 francs. Pp. 432, with 125 illustrations. Paris: Masson & Cie, 1931.

This is one of a series of monographs on various topics in pediatrics which Professor Nobécourt has published at various times since 1921. It consists of a series of lectures or clinics devoted to the blood and blood-forming organs in children. The author discusses clearly and in an interesting manner all the diseases of the blood, first presenting a case in detail and then following with an elaborate discussion of the pathology and differential diagnosis. The book is illustrated with graphs and pictures and comprises practically all the blood dyscrasias in infancy and childhood. Any one who has had the opportunity of attending some of Professor Nobécourt's clinics knows what a kind and able clinician he is.

The Harvey Lectures: Delivered under the Auspices of the Harvey Society of New York, 1929-1930, under the Patronage of the New York Academy of Medicine. By Dr. Ernst P. Pick, Dr. E. K. Marshall, Jr., Dr. E. W. Goodpasture, Dr. Alan M. Chesney, Dr. Philip E. Smith, Dr. Esmond R. Long, Dr. W. J. V. Osterhout, Dr. Rufus Cole and Dr. Graham Lusk. Series XXV. Cloth. Price, $4. Pp. 225, with illustrations. Baltimore: Williams & Wilkins Company, 1931.

The Harvey Lectures for 1929-1930 include the following: The Regulation of Water Metabolism, by Dr. Ernst P. Pick, professor of pharmacology, University of Vienna, Vienna, Austria; The Cardiac Output of Man, by Dr. E. K. Marshall, Jr., professor of physiology, Johns Hopkins School of Medicine, Baltimore; Etiological Problems in the Study of Filtrable Virus Diseases, by Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, Tenn.;

Acquired Immunity in Syphilis, by Dr. Alan M. Chesney, associate professor of medicine, Johns Hopkins School of Medicine, Baltimore; Relations of the Activity of the Pituitary and Thyroid Glands, by Dr. Philip E. Smith, professor of anatomy, Columbia University College of Physicians and Surgeons, New York; A Chemical View of the Pathogenesis of Tuberculosis, by Dr. Esmond R. Long, professor of pathology, University of Chicago School of Medicine, Chicago; Electrical Phenomena in the Living Cell, by Dr. Winthrop J. V. Osterhout, member of the Rockefeller Institute for Medical Research, New York; Progress of Medicine During the Past Twenty-Five Years as Exemplified by the Harvey Society Lectures, by Dr. Rufus Cole, director of the Hospital of the Rockefeller Institute, New York, and the Harvey Society by Dr. Graham Lusk, professor of physiology, Cornell University Medical College, New York. The first twenty-five volumes of these lectures have constituted a record of scientific research. The history of the society, as told by Dr. Graham Lusk at the supper in celebration of its twenty-fifth anniversary, is a most interesting medical anecdote which needs to be read in its original form to be appreciated. The society seems to have arisen in the brains of Dr. Graham Lusk, Mrs. Anna Bowman Dodd and Dr. Samuel J. Meltzer. In its formation many distinguished men took part. The first lecture was given in German by Prof. Hans Horst Meyer of Vienna, and the society was introduced to the public by Dr. C. A. Dana. Because it contains an index to the first twenty-five volumes of the society, the present volume is especially valuable.

Die medikamentöse und allgemeine Behandlung der Ohrenkrankheiten. Von Dr. Conrad Stein, Privatdozent an der Universität Wien. Paper. Price, 6.90 marks. Pp. 103. Vienna: Julius Springer, 1931.

Any sound and rational program of therapeusis, even if it relates to special diseases such as those of the ear, as in Dr. Stein's monograph, must rest on a sound knowledge of the causes of those diseases. Furthermore, every physician prescribing treatment must through good judgment and experience (and this includes the experience of others in his own field) be aware of those conditions in which treatment cannot possibly cure but is only palliative. In general, the author has done well. He takes into consideration all forms of therapy and not only those relying on medicaments. There seems to be, as is so generally the case on the continent, a reliance on proprietary remedies without a careful checking up on the part of any official body of the claims of the various manufacturers.

Surgeon of the Seas: The Adventurous Life of Surgeon General Jonathan M. Foltz in the Days of Wooden Ships. Told from His Notes of the Moment by Charles S. Foltz. Cloth. Price, $3.75. Pp. 351, with illustrations. Indianapolis: Bobbs-Merrill Company, 1931.

Jonathan M. Foltz was commissioned assistant surgeon of the navy by President Jackson in 1831. He became surgeon general of the navy under President Grant. His work took him to the coast of Sumatra in pursuit of pirates, and to Mexico and other countries. In the Civil War he was fleet surgeon on the *Farragut* on the Mississippi River. After the war he accompanied Farragut on the cruise around the world. The present volume is constructed by the author from notes and letters. It is an engaging narrative with a special interest for physicians. The personal relationships of Dr. Foltz to Polk and Buchanan and to other notables afford a striking insight into conditions during the administrations of these presidents. The book is provided with interesting illustrations and an adequate index.

Proceedings of the Second International Congress for Sex Research, London, 1930. Edited by A. W. Greenwood. Cloth. Price, 21/-. Pp. 637, with illustrations. Edinburgh: Oliver & Boyd, 1931.

This volume is divided into five parts, dealing with biology, hormones, therapy, contraception and sociology. Practically all the studies here concerned are of scientific value. In the second section, particular attention is paid to the male and the female sex hormone and also to pituitary hormones. Contributions by Aschheim, Koch, Funk, Frank and Moore indicate the basic character of this material. As is usually the case, the least critical portions of the book are those dealing with therapy. Contributions on theelin and menformon are especially uncritical. The articles in this collection are in English, French, German and Italian.

The Black Death and Men of Learning. By Anna Montgomery Campbell, Assistant Professor of History, New Jersey College for Women. Cloth. Price, $3. Pp. 210. New York: Columbia University Press, 1931.

The great plague, known as black death, which swept across Europe in the fourteenth century influenced every phase of human life. Several volumes have been published concerning its manifestations. With the scientific knowledge of that day, the plague was believed to be due to some divine manifestation of wrath. The present volume deals with the effects of the plague on science. Chapter 4 concerns particularly its effects in the field of medicine, surgery and hygiene. There is a discussion of the members of the medical faculty who died of the disease and of attempts made through sanitation and hygiene to control the pestilence. Other chapters concern the effects of the plague on universities and schools and on other intellectual fields. A carefully compiled bibliography and index complete this excellent contribution to the history of science.

A System of Bacteriology in Relation to Medicine. Volume IX. By J. A. Arkwright, S. L. Baker, and others. Medical Research Council. Cloth. Price, £1 1s. 0d. Pp. 364, with 86 illustrations. London: His Majesty's Stationery Office, 1931.

This volume completes a system of bacteriology prepared under the auspices of the Bacteriological Committee of the Medical Research Council. It includes sections on the design of bacteriologic laboratories, the microscopic demonstration of bacteria, the preparation of culture mediums, such technical questions as the determination of p_H, the aerobic and anaerobic methods, isolation of single cells, filtration, bacteriophage, serology, anaphylaxis, breeding and care of laboratory animals, vitamin A deficiency, ultraviolet therapy, electricity, and the determination of the value of disinfectants. The book includes also the general index to the nine volumes. The material in this book is on a par with that in the preceding volumes and makes the study complete. No modern school or institution devoted primarily to bacteriologic studies can afford to be without this system.

Confessio Medici. By Stephen Paget, F.R.C.S. Reissued, 1931. Cloth. Price, $2. Pp. 158. New York: Macmillan Company, 1931.

This volume, first published in 1900, is now reprinted because of the demand for these excellent essays. To the physician, the nurse or any worker in the field of health the essays are inspirational. The essay for students establishes a point of view. The essay on Paré is a beautiful example of writing in medical history. The essays on medical practice, its rewards and its dissatisfactions will strike a sympathetic chord in every physician. The final essays on "Retirement" and "The Very End" lead gradually to the epilogue on the privileges of the physician:

"The natural dignity of our work, its unembarrassed kindness, its insight into life, its hold on science—for these privileges, and for all that they bring with them, up and up, high over the top of the tree, the very heavens open, preaching thankfulness. Circle above circle, the reasons for it are established, out of the reach of words."

Gewerbekrankheiten: Klinische Grundlagen der 22 meldepflichtigen Berufskrankheiten. Von Dr. med. Ernst W. Baader, Dozent für Berufskrankheiten an der Universität Berlin. Paper. Price, 9 marks. Pp. 144, with 29 illustrations. Berlin: Urban & Schwarzenberg, 1931.

Most books on occupational diseases are ponderous volumes, with far too many theoretical considerations to meet the needs of the general practitioner in industrial communities, who, however, is the one who sees the greatest number of cases of trade disease. Here is a small, well written booklet, embodying the essentials of medical requirements on the twenty-two occupational diseases compensable in the author's country. According to the preface, "The study of the relation between occupation and sickness is one of the most interesting and promising fields of future medicine, which, unfortunately, up to the present time, has only lightly been touched on by the general practitioner. The necessity for an increased knowledge of toxic work substances is, especially in industrial countries like Germany, most profound." The author ably discusses the practical aspects of the commoner trade diseases. He includes, among others, the clinical conditions arising after exposure to lead and its compounds; mercury and its compounds; arsenic and its compounds; phosphorus; manganese; benzene and its homologues; nitro and amido compounds of the aromatic series;

carbon bisulphide; hydrogen sulphide; carbon monoxide; compressed air; noise and other deafness-producing conditions; silicosis and other forms of pneumonoconiosis; parasitic conditions, such as hookworm infestation; harmful rays; skin diseases, and tropical diseases. This booklet should be translated into English for the use of practitioners in this country. It should serve as a stimulus to authors in this country to prepare simple textbooks covering occupational diseases of particular interest to specific areas, such as a textbook entitled "The Practical Medical Aspects of Occupational Diseases Compensable in New York." More books on occupational diseases are needed. This book is welcomed because of its merit. Others will be welcomed.

The Doctor Explains. By Ralph H. Major. Cloth. Price, $3.50. Pp. 277, with illustrations. New York: Alfred A. Knopf, 1931.

As a contribution to the growing literature for the public on subjects of health, Dr. Ralph Major contributes thirteen excellent essays on topics of major interest. These include:

1. The Physical Examination.
2. Seeing the Invisible.
3. The Rôle of the Blood.
4. Heart Disturbances.
5. The Mysteries of Blood Pressure.
6. The Dangers of Sugar.
7. Body Fuel and Its Consumption.
8. Vitamins and Deficiency Diseases.
9. The Malady of Venus.
10. Hypersensitive People.
11. X-Rays and Other Rays.
12. The Story of Antisepsis.
13. The Conquest of Pain.

Dr. Major writes directly and simply but without extraordinary literary skill. He uses the historical background for developing interest, but from the point of view of the reader who is looking for practical information there is somewhat too much of history in proportion to the amount of usable fact. Thus the chapter on "Body Fuel and Its Consumption" includes about three pages of fact and about fifteen pages of history. For those who want their medical information without too much romance, who want it directly and understandably, Dr. Major has provided a most satisfactory book.

Stereoskopischer Atlas der äusseren Erkrankungen des Auges nach farbigen Photographien: Für Studium und ärztliche Fortbildung. Mit begleitendem Text von Karl Wessely, Professor in München. Lieferung 3. Bild 21-30. Boards. Price, 12 marks. Munich: J. F. Bergmann, 1931.

This outfit includes ten of a series of thirty stereoscopic colored plates of diseases of the eye, with an explanatory text. The plates are beautifully made in colors and are therefore excellent for study by both the specialist and the student.

The Great Physician: A Short Life of Sir William Osler. By Edith Gittings Reid. Cloth. Price, $3.50. Pp. 299, with 10 illustrations. New York: Oxford University Press, 1931.

The author of this volume was a close friend of Dr. Osler and of his family. In preparing her book she has utilized material previously assembled by others and has had the help of other friends and biographers. This book does not substitute for and does not supplement the famous "Life of Osler" by Harvey Cushing. It is rather a simpler and condensed consideration, handsomely prepared and therefore especially suited to the reader who cannot devote the time and the thought that the more comprehensive work requires. The book is beautifully printed and has an excellent index.

Tables of Food Values. By Alice V. Bradley, B.S., Supervisor and Instructor of Nutrition and Health Education, State Teachers College, Santa Barbara, California. Cloth. Price, $2. Pp. 128. Peoria, Ill.: Manual Arts Press, 1931.

These tables have been accumulated from computations published in other volumes as well as by the author herself. The physician and the dietitian who prescribe diets for patients with various disorders will find it of the utmost usefulness. The measures are given in quantities ordinarily used. For each food substance, information is given as to weight in grams of protein, fat and carbohydrates; total calories; the amounts of calcium, phosphorus and iron; vitamin content; value as a source of bulk, and the reaction, whether acid or basic.

Medicolegal

Trauma, Eczema and Workmen's Compensation

(Bernard v. City of Lafayette (La.), 132 So. 395)

The plaintiff, a common laborer, in the course of his work was struck on his leg about six inches below the knee by a heavy iron pipe. The only visible evidence of injury at the time seems to have been a scratch about 2½ inches long. He did not believe the injury serious, but on the Sunday night which followed the evening of the accident he was awakened by the effects of the injury and by Monday morning he could hardly stand on his leg. His foreman testified that a day or two after the accident the skin was scratched and red and the leg "kind of swollen," but not in a very bad condition. Three or four days later the plaintiff returned to work. He got wet while at work, by standing in mud and water during the entire day, the water being clear water from the city's water mains. According to his testimony, eight days after the accident pimples and little "heat eruptions" began to grow out around the sore or bruise on his leg. These pimples or sores spread in the course of a few months, covering the hands, legs, and in fact the whole body. The plaintiff brought suit under the workmen's compensation act, attributing the eruption to the accident from which he had suffered. In the trial court, judgment was given in his favor. The defendant, however, appealed, and the court of appeal of Louisiana, first circuit, annulled the judgment and refused the plaintiff's demand (*Bernard* v. *City of Lafayette*, 126 So. 585), saying: "It is not shown that the eczema with which the plaintiff is infected is the natural result of an accident received as alleged, nor that an existing condition in plaintiff's system was thereby activated into virulence." On a rehearing, however, the appellate court reversed that judgment and affirmed the judgment of the district court in favor of the workman.

The physicians who testified in the case had not examined the plaintiff until several months after the accident, when the eczema or rash had covered the body of the plaintiff, and not at a time when they might have made observations that would have enabled them to give expert testimony in reference to the origin of the disease. One of these physicians testified "that the affection of which plaintiff was suffering begins by an infection caused by a germ, and that a person with an abrasion on his leg would be subject to an eczema." Another testified "that he found plaintiff was suffering from an exudative eczema which was most probably caused by some broken or slight abrasion of the skin surface" and in such cases "the cause is not internal but is specific and external." The third medical witness, appointed by the court as an expert, testified "that it is possible for a person with a bruise or scar exposed to mud and water to develop the condition in which he found plaintiff when he made his examination." There was nothing in the testimony of this last witness, said the court, that contradicted the testimony of the other two physicians in reference to the probable origin of the trouble.

It was shown overwhelmingly by the evidence, the appellate court concluded after the rehearing, that prior to the accident the plaintiff was and had always been in fine health, strong, robust, and a reliable, efficient laborer, and, the court added:

> It is singular, and indeed passing strange, that, if the eczema of which he complains had had its origin from some invisible internal cause, arising from nervousness or such like, there had never been any indication that he carried in his system a trouble of that character. Usually, nature gives a warning by some symptom or other of an approaching disease. There should have been, it seems to us, some premonition of the coming trouble. If he really had such a dormant disease in his system, it is again very singular that it should have, immediately after the accident, started to grow from the point of injury and from there spreading over his whole body.
>
> It is known today by laymen, and which is not disputed by the physicians who testified in this case, that practically all diseases are caused by microbes, bacteria, or germs. It is also known that, when water, whether from city mains, clear or not, is mixed up with the dirt of ditches or streets, that mud, the result of it, may at any time be saturated with microbes or germs which may bring about different forms of diseases, and exceedingly virulent in character.
>
> If plaintiff was not affected with the trouble when he first received the injury, we think the proof shows with sufficient legal certainty that, after his exposure to the mud in laying the pipe, he was infected with microbes or germs which laid concealed there.

Insurance, Life; Presumption Against Suicide.—A policy on the life of the deceased provided that if within one year after its date the insured should die by his own hand or act, whether sane or insane, liability should be limited to the amount of the premiums paid. After the insured's death within the one year period, the insurer claimed that he had died by his own act. The insured had suffered from pellagra for a number of years, but his physician went no further than to say that he thought "at one time that 'he was possibly a little off,'" but that perhaps he would have overlooked that fact if he had not been hunting for it. Neighbors and associates testified that they had never noticed anything wrong with his mentality. The insured and his wife were found dead in their home. His wife was on the bed, apparently having been killed by a blow on the head with some blunt instrument. She had died apparently at least eight hours before her husband, as determined by the relative degrees of decomposition of their bodies. The insured was lying on the floor, with his throat cut on both sides and incisions on both wrists and ankles. Lying near him was a large knife, and on the mantlepiece were a small knife and a razor blade, on all of which, as well as on an electric bulb, there was blood. Bloody prints were on the floor, apparently the tracks of some one who had stepped in the blood. There was testimony to the effect that the front door of the premises was unlatched, that it was the custom of the insured to leave the doors unlocked, thus enabling any one to enter the house without difficulty. There was further testimony that a few days before his death he had received $400 in a business transaction, which could not be found or accounted for. Neighbors had heard no disturbance in the house. The furniture in the room was not disarranged and there was no evidence of the ransacking of trunks, chests, bureau drawers, or other receptacles such as might have contained money. In quoting its own previous opinion (*McKendree* v. *Life Insurance Co.*, 112 S. C. 335, 99 S. E. 806, 807) the court said:

> The presumption of fact is that a man will not take his own life. Every action of a man, voluntary and involuntary, tends to preserve his life.

Under the testimony, said the court, it could not be said, as a matter of law, that the presumption against self-destruction had been overcome and the fact of suicide established. As more than one inference could be drawn from the evidence as to how the insured came to his death, the trial judge properly submitted the question to the jury.—*Swofford v. Life Ins. Co. of Virginia (S. C.), 157 S. E. 7.*

Dying Declarations: Mental State of Declarant.—The declarant died as the result of a gunshot wound, inflicted June 18, 1929. The bullet entered "the summit of the head," in a line drawn from the opening of one ear to the opening of the other, directly over the head. The bullet split, one half passing through the skull into the brain and the other passing along the top of the skull, under the scalp, emerging and finding lodgment in the wall near the ceiling. In the course of an operation an incision was made across the front of the head, an inch and a half above the eyebrows. The bone was found "shattered there, cracked loose." The surgeon removed such loose pieces of bone as he thought proper, along with parts of the brain, and extracted from the right lobe of the brain the fragment of the bullet that had lodged there. Dying declarations were taken on July 27 and August 9, and the patient died on August 14, 1929. An autopsy showed the path of the bullet through the right lobe of the brain, touching the left lobe also a little in one place. Posterior to it, there was necrosis. There was evidence of a devitalization of tissues along the course of the bullet.

The wife of the deceased was convicted of murder and appealed to the Supreme Court of Nevada, where her conviction was affirmed (*State v. Watts*, 290 P. 732). On a rehearing, it was urged, among other things, that because of the nature of the wound inflicted on the deceased, and his weakened condition, his brain had deteriorated very materially and his mentality was not sufficient to justify the introduction of the dying declaration made by him; also that there was a strong likelihood and possibility of his laboring under "a hallucination" by reason of the weakened condition of his brain when the dying declarations were made. The testimony of several witnesses showed, however, that at various times between the infliction of the wound and death, the mind of the deceased was clear. The attending physician testified that until about July 23 or July 24 the mentality of his patient was clear; that on or about July 27 and for four or five days prior thereto he was "slipping pretty fast," and between July 27 and August 9 his physical condition was progressively bad, but that his mentality on July 27 and August 9, the days when the dying declarations were made, was quite clear. After having examined the records "with the utmost care and the most minute scrutiny," the Supreme Court of Nevada concluded that the dying declarations were properly admitted in evidence.—*State v. Watts (Nev.), 296 P. 26.*

Optometry: Eyesight Testing Device Supplied for Use by Customer.—In Missouri, persons, firms and corporations who manufacture or deal in eye-glasses or spectacles in stores, shops or other permanently established places of business are not required to be licensed under the optometry act. The defendant sold eye-glasses in his jewelry store in Kansas City. In his store he kept a "self-fitting eye-testing machine," by the use of which customers were supposed to be able to determine, each for himself, the kind of eye-glasses he needed. The state instituted a prosecution for practicing optometry without a license, contending that the use by the defendant, or the furnishing by him for use, of the device described constituted something more than the sale of glasses and was the practice of optometry. The defendant was convicted. Thereupon he appealed to the Supreme Court of Missouri, contending that under the exempting provisions of the optometry practice act he was permitted to facilitate the sale of eye-glasses by the use of the device described. The Supreme Court upheld his contention, reversed the judgment of the trial court, and discharged the defendant. In exempting from the operations of the optometry practice act, persons who deal in eye-glasses or spectacles in stores, shops and other permanently established places of business, said the court, the legislature must be presumed to have intended that such dealers might do the things properly incident to such dealing. The sale of eye-glasses presupposes some test or trial by the customer to determine which glasses best suit him, just as in buying a suit of clothes or a pair of shoes there must be a "trying on" or test to determine the fit. If the dealer permits the customer to take from a tray, put on, and look through, pair after pair of glasses, or if the dealer hands the customer from a tray one pair of glasses after another until the customer finds the pair that suits him, it would hardly be contended that was more than is permissible under the exemption. The testing device furnished by the defendant, said the court, was in effect only the means by which a customer could try various eye-glasses without actually handling them.—*State v. Knapp (Mo.), 33 S. W. (2d) 891.*

Insanity: Prior Mental Condition as Evidence.—Evidence of prior and subsequent mental conditions is admissible to determine a person's mental condition at the precise time of the act in issue. A witness who has had opportunity and occasion to know and observe a person whose sanity is impeached may testify to facts and may express an opinion based on his knowledge and observation as to the mental condition of such person. While evidence of previous insanity of a temporary character may not raise a presumption of continued insanity, it may be considered by the jury in connection with other evidence in determining an issue as to a person's mental capacity.—*Mangum v. Brown (N. C.), 156 S. E. 535.*

Society Proceedings

COMING MEETINGS

Philippine Islands Medical Association, Manila, December 15-18. Dr. A. S. Fernando, 817 Taft Avenue, Manila, Secretary.

Society of American Bacteriologists, Baltimore, December 28-31. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., December 8-11. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Denver, December 4-5. Dr. Frank R. Teachenor, 306 East Twelfth Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

15: 2435-3117 (Oct.) 1931

*Occurrence of Malignancy in Radioactive Persons. H. S. Martland, Newark, N. J.—p. 2435.
*Prognosis of Gynecologic Cancer. H. C. Taylor, Jr., New York.—p. 2517.
Cancer of Thyroid Gland. H. M. Clute and S. Warren, Boston.—p. 2563.
Giant Intracanalicular Fibro-Adenomyxoma of Breast: So-Called Cystosarcoma Phyllodes Mammae of Johannes Müller. B. J. Lee and G. T. Pack, New York.—p. 2583.
Comparison of Conditions Associated with Breast Cancer in Great Britain and America. J. M. Wainwright, Scranton, Pa.—p. 2610.
*Malignancy of Testis, with Especial Reference to Undescended Testis: Seventy-Six Cases (Seventeen Cases Previously Reported). C. E. Rea, Minneapolis.—p. 2646.
*Investigation of Physical Nature of Cancer Cells. G. W. Crile, Maria Telkes and Amy F. Rowland, Cleveland.—p. 2659.
*Interrelations Between Histologic Structure and Blood Chemical Findings in Cancer. W. C. Hueper, G. E. Woodward and E. G. Fry, Philadelphia.—p. 2666.
*Relation of Heredity to Cancer Occurrence as Shown in Strain 621: Studies in Incidence and Inheritability of Spontaneous Tumors in Mice. Maud Slye, Chicago.—p. 2675.
*Effect of Injection of Heated Tumor Tissues on Resistance to Tumor Implantation. K. Sugiura and S. R. Benedict, New York.—p. 2727.
Is There a Specific Bacterial Irritant to Four Sites of Carcinoma? E. W. Saunders and Mary A. Cooper, New York.—p. 2745.
*On Relation Between Parathyroid Hormone and Growth of Rat Carcinoma T. S. Paik, Seoul, Korea.—p. 2756.
Recent Biochemical Research in Cancer with Especial Reference to Metabolism of Normal and Malignant Cell. E. C. Dodds.—p. 2765.
Role of Heredity in Determining the Incidence and Growth of Cancer. C. C. Little, Bar Harbor, Maine.—p. 2780.
Action of Tumor Extracts on Spread of Experimental Vaccinia of Rabbit. F. Duran-Reynals and F. W. Stewart, New York.—p. 2790.

Occurrence of Malignant Conditions in Radioactive Persons.—Martland calls attention to certain data that he has accumulated in the study of radium dial painters which may have an important bearing on future research in the etiology of cancer and of certain obscure blood diseases. His studies indicate that it is important to have proper medical supervision over the use of radium and roentgen rays for therapeutic purposes, and governmental control over industries and occupations in which exposure to radioactive substances takes place. It would seem that the use of radiations for therapeutic purposes should be confined to hospitals and institutions specializing in and competent to handle such treatments, and that the indiscriminate use of radium and roentgen rays should be in some way controlled. All occupations in which the handling of radioactive substances occurs should be under strict governmental control and supervision. Rules and regulations covering the dangers of exposure should be outlined. Technical methods should be devised in specific industries so that exposure is reduced to a minimum. If in a certain industry the exposure cannot be reduced to a safety minimum, the procedure in use should be given up for some other method; if this is not possible, the industry should be discontinued. In this respect it is interesting to note that the U. S. Public Health Survey, which shows that the habit of licking brushes in the watch dial industry has been stopped and that various mechanical methods have been devised to apply luminous paint, states that, in spite of the utmost care and precautions against undue exposure, girls who work under the new methods still become radioactive and show an average of 0.5 microgram of radioactive substance in their bodies. It is a question whether under these conditions one should be satisfied to regard the industry as a safe one. The foregoing arguments apply also to the sale of radioactive waters, emanators, activators, and so on. The sale of all such commodities should be stopped until it is definitely established that they are harmless. The indiscriminate sale of these waters and apparatus by laymen and quacks is criminal. Their therapeutic effects are nil if one excludes the psychic effects produced on the patient. The human race would not suffer by eliminating them. These studies, aside from drawing attention to the occurrence of malignant tumors in radioactive persons and giving another cause for osteogenic sarcoma, may be of importance in the experimental study of cancer. It may be possible to show new methods by which malignant tumors may be produced in animals. Recently, in Germany, bone sarcoma has been produced in the rabbit by means of irradiation from implanted radium. The question arises, May not other forms of malignancy depend on the presence in the human body of increased amounts of radioactivity too small, perhaps, to be detected by the present methods? This question will be harder to answer than appears at first thought. While the amounts of radioactive substances in the dial painters are extremely small, being measured only with great difficulty, they must be much greater than one would ever expect the normal individual to acquire. Unfortunately, at the present time, it is impossible to estimate much smaller quantities. A great deal less might produce malignant changes over a longer period of time. Some have thought that 10 micrograms of radium deposited in the tissues of the body is probably just within the limits of tolerance of the average person. From the author's experience it is impossible to state what is the greatest amount of radioactivity the body can safely carry. He believes that less than 0.5 microgram is dangerous. Theoretically the exposure to or the use of any radioactive substance that will increase the normal radioactivity of the body is dangerous. At the present time he can only suggest that some other types of malignant tumors may be caused by minute amounts of radioactive substances to which the human body, in its normal environment, is exposed.

Prognosis of Gynecologic Cancer.—Taylor presents a clinical and pathologic study of 739 cases of gynecologic cancer observed at the Roosevelt Hospital from 1910 through 1930. Cancer of the cervix in the only two reportable years (1924-1925) in which radium was used practically exclusively was curable for at least five years in 18 per cent of all cases. The amount of irradiation in these years was inadequate. An increase in dosage, a better method of application, and the addition of high voltage roentgen therapy will, it is hoped, lead to improved results for the years after 1927. In the years 1921-1923, however, when the plan of treatment for favorable cases was preoperative radium and later radical hysterectomy, the absolute five-year cure rate was 29.7 per cent. Carcinoma of the corpus gave an absolute cure rate of 25.8 per cent, a disappointing figure, owing in part to a large number of lost cases. Among the traced cases in which operation was performed the results approached the average reported by other institutions. The high mortality, especially in women over 60, leads to the suggestion that irradiation should be substituted for surgery at least in this group. Carcinoma of the ovary yielded only 6.9 per cent of cures, a very low figure, owing perhaps entirely to a review of the sections and the exclusion of all cures in cases possibly classifiable as papillary cystadenoma. The successes were all due to factors uncontrollable by the surgeon; namely, the restriction of the growth at the time of operation to an unruptured cyst. Roentgen therapy has not produced cures in otherwise incurable cases in the Roosevelt clinic but will be continued in view of favorable outside reports. Carcinoma of the vulva yielded 21.1 per cent of cures, but it is probable that this figure might have been better had several of the patients in the early cases not been at first treated by a too conservative operation. Carcinoma of the vagina has recently been treated by radium, which has led to some preliminary encouraging results. Sarcomas of the uterus and ovary offer difficulties in histologic diagnosis which may largely affect the reported percentage of cures. From a more practical point of view a failure on the part of either surgeon or pathologist to differentiate myosarcoma from a benign fibromyoma may jeopardize the individual patient's chances. A few rarer tumors, carcinoma of the tube, chorionepithelioma, and sarcoma of the rectovaginal septum are reported. An apparent cure is noted in a case of the disease last cited. Advanced peritoneal malignant tumors of undetermined origin, usually regarded as ovarian, are separately con-

sidered. They form a fairly large and quite hopeless group. A careful review of the pathologic sections of cases of cancer of the cervix has led to little corroboration of the finding of several writers that histologic form bears a relation to prognosis as the result of variations in malignancy or in radiosensitivity. There was a very slight indication of such a relationship in carcinoma of the corpus. The correct separation of corpus adenocarcinoma from endometrial hyperplasia, of papillary cystadenocarcinoma of the ovary from papillary cystadenoma, of myosarcoma from fibromyoma, and of fibrosarcoma from fibroma of the ovary is, however, of vital importance in prognosis.

Malignant Tumors of Testis. — Rea states that while malignant tumors of the testis are uncommon, they occur relatively much more frequently in undescended than in descended testes, and the danger of malignant tumor in the abdominal is just as great as in the inguinal testis. The present forms of treatment are unsatisfactory. The proportion of four-year survivals after orchidectomy is but 13.2 per cent. When suitable irradiation is added to orchidectomy, this percentage is materially increased in patients without obvious metastases. Approximately 7 per cent of those with obvious metastases are saved, at least temporarily, by irradiation. The value of Coley's serum in conjunction with other methods requires further study. The best results from any single method in the operable cases follow the radical operation (block excision of the testis, spermatic cord, and regional lymph nodes). Judging by the literature, the author believes that results surpassing those yet attained should attend the combination of radical surgery and irradiation. Education of the public to seek competent medical advice early is the only practical solution of the problem of malignant tumors of the testis at present. Biopsy and frozen section diagnosis should be resorted to, with the patient prepared for immediate radical surgery, in early doubtful cases. The undescended testis should be placed in the scrotum, where it can be observed, in all cases. This proving impracticable, it should be excised, provided the opposite organ is normally placed or placeable.

Physical Nature of Cancer Cells.—In their investigation of the physical nature of cancer cells, Crile and his associates have sought evidence in support of the widely held theory that cancer owes its development to some alteration in the cells of the tissues as the result of some mechanical, physical or chemical factor. To this end they have been endeavoring to discover some physical principle which might account for the conversion of normal cells into cancer cells as the result of single or repeated injury; for cancer cells do not originate in uninjured, unchanged tissues, but in tissues which have been subjected to chronic irritation. It is clear that the cancer cell must owe its formation to the operation of existing laws of growth in the host, for cancer originates and lives only in the living. The problem, therefore, is concerned with the struggle for survival between the cancer cell and the normal cell; and the logical point of attack would seem to be the characteristics of the normal cell. The authors have therefore been trying to discover what physical differences might account for the conversion of differentiated into undifferentiated cells; of cells whose energy is used primarily for function into cells whose energy is used primarily for growth. They have found that as compared with neighboring cells cancer cells appear to have a greater conductivity and capacity. In rat cancer the injury current of a cancer is opposite to that of the neighboring tissues and organs. The electric potential may be an index controlling the treatment. By ionization the sign of charge of a cancer cell may be changed and the change maintained. It is suggested that after cancer tissue has been partly reduced by ionization it may be completely reduced by radiation at a lesser dosage than that used clinically.

Blood Chemical Examination in Cancer.—Hueper and his associates correlated the malignancy indexes and the blood p_H values in thirty-four cases of carcinoma. A preponderance of histologically highly malignant tumors was found in patients with an alkalosis, while the tumors of histologically low malignancy predominated in patients with a normal blood p_H. The alkalosis of the blood in cancer patients varies not only with the extent of the disease but also with the degree of malignancy and maturity of the tumor. The degree of cellular irregularity of cancerous tissue is increased in patients with an alkaline p_H of the blood as compared with patients with a blood p_H in the normal range. In about one third of the cancer patients with a hyperglycemia (which was present in 78.3 per cent of the cases) a high number of mitoses was found, while this phenomenon was absent in cancer patients with a normal blood sugar.

Relation of Heredity to Occurrence of Cancer.—Slye presents the record of an entire single strain of mice derived from the mating of a cancerous female and noncancerous male, and bred through three generations. The report includes all totals regarding the occurrence of malignant diseases and the ages of the mice. The entire strain, including the parents, consisted of 207 individuals, of which 115 were females and 92 were males. Of these, 23 were cancerous, or slightly over 11 per cent of the strain. The matings in this strain were practically typical of human matings, and the 11 per cent of neoplasms is a close approximation to the percentage of occurrence of neoplasms in man. The types of neoplasm occurring in this strain were carcinoma of the mammary gland, squamous-cell carcinoma of the skin, carcinoma of the lung, and leukemic diseases. In this strain two external factors were noted in connection with the two predominating types of cancer: (1) chronic dermatitis of the muzzle and eyelid skin, in both sexes; (2) a marked tendency to the formation of cysts in the inguinal mammary gland. Every case of skin cancer and every precancerous condition of the skin arose on a chronic dermatitis, frequently of long duration; and some of the mammary gland carcinomas seem to have arisen in mammary gland cysts. Other characteristics noted in the strain are the prevalence of pneumonia and nephritis, a tendency to emaciation in all of middle and late life, and a tendency to longevity. The average age at which cancer was noted in this strain was ten months and one day. The average age at death of the cancerous mice was 1 year, 1 month, 12 days. The average age at death of the noncancerous mice was 1 year, 3 months, 29 days. Thus, not only did the noncancerous mice of any given generation live well beyond the age at which cancer occurred in the cancerous mice, but their noncancerous offspring also lived long enough to confirm the classification of both themselves and their parents as noncancerous individuals. The twenty-three cancers were distributed as follows through the four generations studied: (1) In the parent generation, one, the parent female of the strain; (2) in the first generation, consisting of nine individuals, none were cancerous; (3) in the second generation of thirty-six individuals, nine were cancerous, and (4) in the third generation of 160 individuals, thirteen were cancerous. All the figures reported are a close approximation to the classic expectation for cancer as a mendelian recessive, and the classification of every mouse is confirmed by its progeny.

Effect of Injection of Heated Tumor Tissues.—Sugiura and Benedict placed fragments of fresh tumor tissues in a Locke-Ringer solution at p_H 7.0 and submitted them to various temperatures for varying periods in order to obtain the minimum lethal time for a given temperature. Inoculation of heat-inactivated Flexner-Jobling rat carcinoma cells previous to implantation of fresh, healthy homologous tumor cells did not prevent the growth of the latter. Injection of heat-inactivated Sugiura rat sarcoma cells produced slight but definite protection against the subsequent growth of new sarcoma cells in the treated animals. Injection of a fragment or emulsion of Rous chicken sarcoma in which the causative agent had been attenuated at a temperature between 45 and 60 C. with a minimum time of exposure conferred marked resistance to the subsequent implantation of the homologous tumor. The immunizing property of the attenuated chicken sarcoma was abolished by prolonged heating or heating the tumor tissue at a much higher temperature. Previous injection with the heat-inactivated Rous chicken sarcoma brought about prolongation of life in the tumor-bearing chickens, subsequently inoculated with viable tumor. Single or repeated subcutaneous or intramuscular inoculations of the heat-inactivated Flexner-Jobling rat carcinoma, Sugiura rat sarcoma, or Rous chicken sarcoma did not have any effect in checking the growth of firmly established tumors in animals.

Parathyroid Hormone and Rat Carcinoma. — Paik describes experiments on rats in which he demonstrated that

there is a close relationship between the growth of transplantable rat carcinoma and the internal secretion of the parathyroid. The internal secretion of the parathyroid stimulates the development of rat carcinoma, but decrease of its internal secretion interferes with development of such a carcinoma.

American Journal of Medical Sciences, Philadelphia

182: 441-596 (Oct.) 1931

Problems of Present-Day Gastro-Enterology. W. C. Alvarez, Rochester, Minn.—p. 441.
Clinical Observations of Immunizing Value of "Natural Bacterial Antigens": Study No. 1. Pneumococci. D. C. Sutton, A. I. Kendall and A. Rosenblum, Chicago.—p. 454.
Diagnostic Program in Food Allergy. W. T. Vaughan, Richmond, Va. —p. 459.
Sydenham's Chorea. R. W. Waggoner, Ann Arbor, Mich.—p. 467.
Creatinuria in Hyperthyroidism. E. J. Kepler and W. M. Boothby, Rochester, Minn.—p. 476.
Hereditary and Familial Diabetes Mellitus. I. S. Wright, New York. —p. 484.
Interpretation of Flarimeter Tests. L. F. MacKenzie, P. V. Wells, E. G. Dewis and L. S. Ylvisaker, Newark, N. J.—p. 497.
Effect of Blood Transfusions on Bone-Marrow Activity as Indicated by Reticulocyte Count. C. Reich, New York.—p. 513.
Primary Hypochromic Anemia (Erythronormoblastic Anemia): New Type of Idiopathic Anemia. W. Dameshek, Boston.—p. 520.
Idiopathic Hypochromemia. W. S. Mills, Montreal.—p. 554.

American Journal of Psychiatry, Baltimore

11: 215-400 (Sept.) 1931

Basic Symptoms of Schizophrenia. M. Levin, Philadelphia.—p. 215.
Mental Hygiene Research. C. M. Hincks, Toronto.—p. 237.
Learning Ability of Schizophrenics. G. E. Gardner, Waverly, Mass. —p. 247.
Encephalitic Sequelae and Their Treatment. S. S. Cottrell, Harding, Mass.—p. 253.
*Alzheimer's Disease: Its Occurrence on Basis of Variety of Etiologic Factors. K. Lowenberg, Ann Arbor, Mich., and D. Rothschild, Foxborough, Mass.—p. 269.
*Sex-Linked Inheritance in Mental Deficiency. A. J. Rosanoff, Rosemead, Calif.—p. 289.
Statistical Study of Hallucinations in Manic-Depressive Psychoses. K. M. Bowman and Alice F. Raymond, Boston.—p. 299.
Association in Normal and Subnormal Adolescents. Edna Willis McElwee, New York.—p. 311.
Case of Ludwig Lewisohn: A Contribution to Psychology of Creative Genius. L. J. Bragman, Syracuse, N. Y.—p. 319.

Alzheimer's Disease. — Lowenberg and Rothschild report two cases of Alzheimer's disease. Although atypical in some respects, clinically and pathologically there were adequate grounds for classifying them with the Alzheimer group. In the first case the Alzheimer disease picture was superimposed on a chronic syphilitic meningitis in a feebleminded person. In addition, the brain showed cerebral hemiatrophy. This was thought to represent the anatomic substratum of the feebleminedness. In the second case there were certain clinical features which seemed entirely inconsistent with a presenile disorder. The etiologic factor in this case was regarded as toxic in nature. These observations, taken in conjunction with others in the literature, lead to the conclusion that Alzheimer's disease is really a syndrome with a multiplicity of etiologic factors. The majority of the cases must still be brought into relation with atypical senile processes. However, there is a smaller group in which the causative agents appear to be toxic or organic diseases that are clearly independent of senility or allied conditions.

Sex-Linked Inheritance in Mental Deficiency.—A little over a year ago, Rosanoff undertook a study of mental disorders in twins. In the course of that study he sought out in state hospitals, institutions for the mentally deficient, prisons, reformatories and other such institutions patients or inmates who had a twin brother or sister living somewhere and accessible to investigation. In the group of mental deficiency cases he has thus far accumulated records of ninety-five pairs of twins. One or both in each pair had mental deficiency. The main purpose of the study was to compare the observations in monozygotic and dizygotic twins. Among the thirty-five pairs of monozygotic twins, both twins were found to be affected in thirty-three instances; and only one was affected, the other having normal intelligence, in two instances. Among the sixty pairs of dizygotic twins, both twins were affected in thirty-two instances and only one was affected in twenty-eight instances. In the entire group there was a greater number of cases of mental deficiency in the male sex than in the female sex; normal subjects were, on the contrary, fewer in the male sex than in the female sex. The greater frequency of mental deficiency in the male than in the female sex was most strikingly shown in opposite-sex twins. Among twenty-seven pairs of opposite-sex twins, both had mental deficiency in eleven instances, the male alone in eleven instances, and the female alone in five instances. It appears in a consistent way that girls make a slightly better showing than boys in intelligence tests and in scholastic record. These facts suggest that gene factors of intelligence may in some cases be carried in the X-chromosomes and not only in the autosomes; or, in other words, that there may be a sex-linked factor in some cases in the genetic history of mental deficiency and of general intelligence. In order to make the simplest provision in biologic symbols and formulas for a sex-linked factor, it is necessary to assume the existence of six possible types of males, nine types of females, and fifty-four types of mating. Theoretically, from thirty-eight of these types of mating only normal offspring can result. The mentally deficient offspring that may result from eight other types of mating may be expected to be equally distributed in the two sexes, as far as the possible influence of any sex-linked factor is concerned. Only male mentally deficient offspring can result from the remaining eight types of mating. When both parents are mentally deficient or when the father alone is mentally deficient, an equal distribution of mental deficiency in the two sexes of offspring may be expected. When both parents are normal or when the mother alone is mentally deficient, mentally deficient offspring of both sexes may result; but their distribution will not be equal in the two sexes, for the cases in which a sex-linked factor may be operative will be included in this part of the material. Here, according to theory, any relative excess of mental deficiency in the male sex must be, at least in part, attributed to a sex-linked factor. A reinvestigation of a part of Goddard's published material, selected by reason of relevance to the questions raised by the author's study, bears out the assumption of a sex-linked factor in the genetic history of mental deficiency. The general relative excess of mental deficiency in the male sex is, however, greater than can be accounted for by this factor; to some extent it must be attributed to some other factor or factors.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

12: 581-638 (Oct.) 1931

*Skin and Radiation. A. Bachem and C. I. Reed, Chicago.—p. 581.
Comparative Value of Various Treatments of Osteomyelitis with Especial Reference to Aluminum-Postassium-Nitrate Method. M. Thorek, Chicago.—p. 591.
Osteomyelitis. L. S. Brookhart, Cleveland.—p. 598.
Diagnosis and Treatment of Acute and Chronic Bone Abscess. F. W. Carruthers, Little Rock, Ark.—p. 602.
High Body Temperature in Relation to Wassermann-Fast Neurosyphilis. L. D. Cady and F. H. Ewerhardt, St. Louis.—p. 605.
*Diathermy in Postoperative Lung Conditions. N. J. Seybold, Toledo. —p. 610.
Physical Therapy and Physician's Obligations. H. M. F. Behneman, San Francisco.—p. 615.

Skin and Radiation.—Bachem and Reed describe experiments from which they draw the following conclusions: Visible (and near infra-red) rays are strongly absorbed by the blood of the corium and subcutaneous layers, with direct effects on the blood to be expected. The heating effect must be rather mild on account of the small absorption in the epidermis and the strong convection by the blood stream. The far infra-red has little penetrating power. Most of it is absorbed in the epidermis. The produced heat is slowly conducted down to the deeper layers and up to the surface and convected away by the blood stream and air circulation. Overexposure of the germinal layer may lead directly to blistering. The ultraviolet exhibits greater variations than the other parts of the spectrum. At 280 micromicrons the absorption in the corneum (and granulosum) is pronounced. The great antirachitic effect of this wavelength must occur in or above these layers. At both sides, 300 and 250 micromicrons, the penetration is greater, more radiation reaching the malpighian layer and the corium. These observations, together with those of Hausser and Vahle, indicate that erythema production occurs in the germinal layer (or the corium) in the shadow of the upper layers. The

stratum corneum (plus granulosum) must play an important part in the protection of these sensitive layers against too strong irradiation. From 250 micromicrons on, the absorption of the horny layers increases rapidly. Near 200 micromicrons the absorption is so complete as to prevent any radiation from reaching the living layers of the skin. These observations prompt some speculation as to the rôle of the skin in the systemic effects of irradiation. The fact that certain effects of a local application are systemic can be explained either by assuming that rays penetrate into the blood stream and produce changes that are reflected in systemic reactions, or that nerve endings in the skin are stimulated, producing reflex changes, or that some substance is liberated in the skin and taken up by the blood and lymph, to be distributed to other organs or tissues.

Diathermy in Postoperative Lung Conditions.—In the diathermic treatment of postoperative lung conditions, Seybold uses large electrodes that cover the whole chest. The electrodes are made of mesh and sewed on white felt 1 inch thick. This mesh is 1 inch smaller on all sides than the piece of felt. Different sizes are kept so as to fit large or small chests. They are placed anteriorly and posteriorly, or occasionally they may be placed laterally in some pleurisy cases. No lubricant is used, just ordinary warm tap water. Treatments are given for thirty-minute periods or longer. They are given every twelve hours, or oftener as indicated. The milliamperage averages from 1,500 to 3,000 with a frequency of 1,000,000. The high voltage tap is always used in the author's cases. Any medication that is requested can always be given, as the diathermy does not interfere.

Canadian Public Health Journal, Toronto

22: 485-540 (Oct.) 1931

Difficulties and Problems in Program for Prevention of Mental Disease. A. T. Mathers, Winnipeg.—p. 485.
Immunization Against Diphtheria in County of Nicolet, P. Q. J. E. Sylvestre, Roxton Falls, Que.—p. 495.
Influence of Mortality Trends of Certain Diseases on Life Expectancy. J. M. Livingston, Waterloo, Ont.—p. 497.
New Lamps for Old. R. B. Jenkins, Edmonton, Alta.—p. 501.
Cutaneous Myiasis in Canada. E. M. Walker, Toronto.—p. 504.
Peter Ludwig Panum 1820-1885: Pioneer in Epidemiology of Measles. J. L. Little, Toronto.—p. 509.
Tribute to Wyatt Galt Johnston, M.D. M. P. Ravenel, Columbia, Mo. —p. 517.

Florida Medical Association Journal, Jacksonville

28: 155-202 (Oct.) 1931

Conservative Renal Surgery. R. J. Holmes and M. M. Coplan, Miami. —p. 163.
Enlarged State Board of Health Program. H. Hanson, Jacksonville. —p. 168.
Endocervicitis. W. M. Rowlett, Tampa.—p. 172.
Focal Infections, Resulting Morbidity and Treatment for Same. T. M. Rivers, Kissimmee.—p. 175.
Witch Doctors and Their Practices. D. W. McMillan, Pensacola.—p. 179.
Granuloma Inguinale. F. E. Daves, Chattahoochee.—p. 184.

Illinois Medical Journal, Chicago

60: 269-352 (Oct.) 1931

Mental Hygiene in the Family. F. P. Norbury, Jacksonville.—p. 281.
Multiple Myeloma. C. D. Center and T. J. Merar, Quincy.—p. 286.
Early Recognition of Gas Bacillus Infection by Roentgen Ray. H. Olin, Chicago.—p. 289.
Hemolytic Streptococcus Bacteremia with Endocarditis and Arthritis, Following Scarlet Fever. M. Kern, Chicago.—p. 298.
Secondary Anemia. R. F. Herndon, Springfield.—p. 302.
Kirchner Pin in Fractures of Long Bones. A. H. Hauber, Chicago.—p. 306.
Dupuytren's Abscess. J. E. Bellas, Peoria.—p. 308.
Challenge of Syphilis. A. Hall, Springfield.—p. 311.
Syphilid of Nervous System. A. B. Magnus, Chicago.—p. 315.
Coronary Thrombosis. W. S. Priest, Chicago.—p. 319.
Scarlet Fever Immunity and Streptococcal Puerperal Infection. G. E. Hudson, Chicago.—p. 328.
Therapeutic Use of Oxygen and Carbon Dioxide. H. P. Miller, Rock Island.—p. 331.
Use of Bacteriophage in Staphylococcic Infections. A. A. Janson and R. L. Larsen, Evanston.—p. 334.
Craniocerebral Injuries. J. D. Kirshbaum, Chicago.—p. 338.
Fever Treatment of Paresis by Means of Diathermy Current and Electric Blanket. S. D. Wilgus and Leah Lurie, Elgin.—p. 341.
Fractures About Elbow Joint. H. D. Grossman, Chicago.—p. 344.
Relationship Between Mental Deficiency and Fields of General Medicine. G. B. Smith, Godfrey.—p. 346.

Johns Hopkins Hospital Bulletin, Baltimore

49: 203-270 (Oct.) 1931

Hemorrhagic Bright's Disease: I. Natural History. T. Addis, San Francisco.—p. 203.
*Study of Late Effects of Toxemias of Pregnancy (Excluding Vomiting and Eclampsia). C. H. Peckham and M. L. Stout, Baltimore.—p. 225.
*Treatment of Anemia of Infancy with Iron and Copper. H. Josephs, Baltimore.—p. 246.
Circulation of the Aqueous. J. S. Friedenwald and H. F. Pierce, Baltimore.—p. 259.

Late Effects of Toxemias of Pregnancy.—Of a series of 545 consecutive deliveries of toxemic patients, excluding eclampsia and vomiting, 66⅔ per cent of the patients were reexamined by Peckham and Stout from four months to four years after delivery, and at that time 40 per cent of them were found to have a definite chronic nephritis. The differential diagnosis between nephritic and nonnephritic toxemia frequently cannot be made during pregnancy or the puerperium, and even at six weeks after delivery the diagnosis is sometimes incorrect. Nephritis is seen more frequently in the older age groups and among multiparas. Two thirds of the nonnephritic toxemias occur in women under 25, and a similar proportion are primiparas. A marked hypertension (systolic 200 mm. or more and diastolic 150 mm. or over) is more frequently associated with nephritis, although an occasional case of preeclampsia is seen with this reading. Albuminuria and its amount is not of prognostic import. The presence or absence of casts in the urine likewise does not give differential information. The phenolsulphonphthalein and Mosenthal renal function tests give almost identical results in the two types of cases. Edema occurs in the same proportion of cases in the two groups. Toxemia patients in general seem to have shorter and easier labors than normal; however, the fetal mortality is high, particularly in nephritis. The blood pressure is higher on discharge in the nephritic type. However, many women who have nephritis leave the hospital with a normal blood pressure, while about a fifth of the women later returning normal still have hypertension. Albuminuria on discharge is noted in relatively the same proportion of cases, nephritic or nonnephritic. Even six weeks after delivery many normal women still have hypertension and albuminuria, while a small number of nephritic patients appear normal in these respects. Only 7 per cent of nonnephritic patients show hypertension or albuminuria prior to the seventh month of pregnancy, whereas over half the nephritic patients were known to be abnormal at that time. However, almost a fifth of the women who ultimately were diagnosed as nephritic were known to be normal until after the seventh month. This would seem to indicate that chronic renal damage may be a result of the toxemic process. If vomiting and eclampsia are excluded, one of every three women seen with a toxemia of pregnancy will ultimately be found to have nephritis. Except in perfectly obvious cases it seems better to defer the final diagnosis until four months after delivery, although a diagnosis intelligently made at the time of discharge from the hospital is incorrect in only one case in nine.

Treatment of Anemia of Infancy.—Josephs treated a series of anemic infants with iron, and iron with copper supplement. The results were considered statistically through the construction of a curve corresponding to the average rise in hemoglobin after iron alone. It was found that copper accelerated the rise in hemoglobin when given in addition to iron. This acceleration was most evident when the hemoglobin was above about 50 per cent, for above this point the hemoglobin curves from patients on iron alone tended somewhat to flatten out, whereas those from patients on iron and copper continued to rise steeply up to about 70 per cent. In this series it made no difference in the speed of recovery whether the child was on a diet of milk alone or whether vegetables or eggs were included, and medicinal iron was found to be far superior to food iron in causing a rapid recovery. The effect of the iron is first on the reticulocytes, then on the hemoglobin, and there usually exists a latent period before the effect on the hemoglobin is manifested by a rise. The end of the latent period appears to coincide with a sufficient rise in reticulocytes. Copper appears to accelerate hemoglobin formation and does not have an effect on the reticulocytes.

Journal of Bacteriology, Baltimore

22: 239-307 (Oct.) 1931

Behavior of Acid-Fast Bacteria in Oil and Water Systems. G. B. Reed and Christine E. Rice, Kingston, Canada.—p. 239.
Gum Production by Azotobacter Chroococcum of Beijerinck and Its Composition. W. B. Hamilton, Quebec, Canada.—p. 249.
Studies on Electrical Charge of Bacteriophage. C. E. Clifton and R. R. Madison, San Francisco.—p. 255.
Five Cases of Infection of Urinary Tract Due to a Member of the Group of Bacilli Named After Morgan. E. Waaler, Oslo.—p. 261.
Streptococci Which Grow at High Temperatures. J. M. Sherman and Pauline Stark, Ithaca, N. Y.—p. 275.
Value of Serologic Tests for Identification of Pseudomonas Malvacearum. E. S. Horgan, Khartoum.—p. 287.
Resistance of Dehydrated Pneumococci to Chemicals and Heat. F. P. Gay, K. N. Atkins and Margaret Holden, New York.—p. 295.

Journal of Bone and Joint Surgery, Boston

13: 669-924 (Oct.) 1931

*Arthroscopy or Direct Visualization of Joints: An Experimental Cadaver Study. M. S. Burman, New York.—p. 669.
Myeloscopy or Direct Visualization of Spinal Canal and Its Contents. M. S. Burman, New York.—p. 695.
Prophylactic Treatment of Free Callus in Articular Trauma of Children. E. Roviralta, Barcelona, Spain.—p. 697.
First Aid for Fractures: Methods and Equipment for Treatment of All Fractures at Site of Accident and on Ambulance During Transportation to Hospital. R. T. Findlay, New York.—p. 701.
*Separate Neural Arch. T. A. Willis, Cleveland.—p. 709.
Arthrodesis Acromiohumeralis Osteoplastica. O. E. Schulz, Prague, Czechoslovakia.—p. 722.
Experimental Arthritis: Changes in Joints Produced by Creating Defects in Articular Cartilage. J. A. Key, St. Louis.—p. 725.
Diagnosis and Frequency of Tuberculous Disease of Knee. H. Sundt, Stavern, Norway.—p. 740.
Split-Heel Approach in Osteomyelitis of Os Calcis. F. J. Gaenslen, Milwaukee.—p. 759.
Operation for Correction of Extremely Relaxed Flat Feet. M. Hoke, Atlanta, Ga.—p. 773.
Use of Anterior Superior Spine and Crest of Ilium in Surgery of Hip Joint. R. K. Ghormley, Rochester, Minn.—p. 784.
Open Reduction of Congenital Dislocation of Hip. F. C. Kidner, Detroit.—p. 799.
New Departure in Treatment of Congenital Dislocation of Hip. A. Krida, New York.—p. 811.
Local and Regional Anesthesia in Orthopedic Surgery. A. Inclan, Havana, Cuba.—p. 816.
Method for Determining Angle of Torsion of Neck of Femur. S. P. Rogers, Elizabethtown, Pa.—p. 821.
*Progressive Pseudohypertrophic Muscular Dystrophy: Results of Treatment with Adrenalin and Pilocarpine with an Analysis of Twenty-Eight Cases. G. de N. Hough, Jr., Springfield, Mass.—p. 825.
Relation of Sympathetic Nervous System to Hypertrophic Arthritis. S. F. Stewart, Los Angeles.—p. 848.
*Fusion of Knee Joint in Cases of Charcot's Disease: Four Cases. M. Cleveland and A. D. Smith, New York.—p. 849.
Displacement of Upper Epiphysis of Femur (Adolescent Coxa Vara) Treated by Closed Reduction. S. A. Jahss, New York.—p. 856.
Rebalancing Operation for Pronated Feet. W. A. Clark, Pasadena.—p. 867.
Peritrochanteric Bursitis: Case. E. Lecocq, Seattle.—p. 872.
Case of Unusual Bone Development. E. Pyle, Waterbury, Conn.—p. 874.
Fracture of Anterior Process of Calcaneus. F. Christopher, Evanston, Ill.—p. 877.
Modified Plaster-Knife Blade. J. B. Griffith, Pittsburgh.—p. 880.
Unusual Fractures of Capitulum Humeri and Capitulum Radii. H. Milch, New York.—p. 882.

Arthroscopy.—According to Burman, the most important indication for arthroscopy is for diagnosis in place of the exploratory operation. But, until arthroscopic pictures of disease are standardized, arthroscopy should first be done, and the observations verified, when necessary, by operation. If the observations arthroscopically are considered definite and decisive enough, it may not be necessary to operate. It is to be expected that, with time and the help of many workers in this interesting field, arthroscopic pictures of disease will become as well known as those of cystoscopy. There should be no hesitation in doing an arthroscopic examination, since it is simple, being a mere puncture in its ultimate essentials, and since it may avoid the more serious opening of the joint. The hole made by the trocar is heart-shaped, and less than 4 mm. in diameter. Whether it is advisable to incise the skin to puncture the joint is a matter of preference. Arthroscopy is indicated also in cases of joint disease the diagnosis of which may be in question and in which exploratory operation is not contemplated. It may be advisable to do an arthroscopic examination to make certain of the diagnosis and therefore to determine the treatment. Arthroscopy should also be done before reoperating on a joint for a possible relapse of an original condition. In this way may be determined, for instance, the posterior remaining fragment of a supposedly completely removed meniscus of a knee joint. When biospy is contemplated to secure synovial specimens, these specimens should be secured by an operative attachment to the arthroscope. Here one is enabled to inspect the joint and to remove the specimen without doing an open operation, especially in doubtful tuberculosis or tumor of a joint. Large bands of adhesion may also be cut by the operating arthroscope. Arthroscopy should be found invaluable in a whole host of diseases—arthritis of joints, diseases of synovia or of the fat pads, intra-articular fractures, foreign bodies or free bodies, injuries to the meniscuses or crucial ligaments of the knee intra-articular tumors, tuberculosis and other granulomas. Therapeutically, ultraviolet rays for internal irradiation of the joint cavity may be produced intra-articularly, and used in the treatment of joint diseases. Arthroscopy is contraindicated when there is no definite indication for it. It should be used discriminatingly in collaboration with a good history and physical examination, and well taken roentgenograms. It is not intended that arthroscopy take the place of joint roentgenograms, nor should the latter be neglected.

Separate Neural Arch.—In a series of 1,520 human skeletons, Willis found a separate neural arch in seventy-nine, or more than 5 per cent. In vertebral columns with twenty-five presacrals, the incidence is almost twice as great as in columns with the regular twenty-four, but the actual percentage in both series is an accident of the sampling rather than a criterion of the population at large. Study of the defect, whether unilateral or bilateral, substantiates its essential origin in a skeletal anomaly and assigns a very minor rôle to trauma. Embryologically the defect falls into the category of anomalous ossifications, of which there are many other examples scattered over the skeleton. It is an anomaly peculiar to the lumbar region and may be found in any lumbar vertebra and on either or both sides, but it is usually confined to the last presacral. Thus spondylolisthesis may be a sign of the anomaly. Trauma plays a secondary part in this condition, the fibrous tissue constituting a point of less resistance to strain than bone structure. The separate neural arch in its origin resembles spina bifida, defective articular processes, and separate bony centers for transverse, mammillary and accessory processes which are peculiarly associated with the lumbar column; it is found more frequently when some other anomaly—such as a twenty-fifth persacral—is present. It is the ultimate result of imperfect ossification, whether this be caused by failure in the ossific process itself or by a defect of the preexisting cartilage.

Progressive Pseudohypertrophic Muscular Dystrophy.—Hough presents data from which he concludes that progressive pseudohypertrophic muscular dystrophy is a more common syndrome than is commonly appreciated, having an incidence of approximately six per hundred thousand of total population in the New England states. The disease is widespread, occurring throughout the civilized world. The recently acquired knowledge of the double enervation of skeletal muscles has opened up a new conception of the pathology and pathogenesis of the disease. Contrary to the original conception that the disease is primarily of the muscle substance, there is evidence to justify the belief that there is a primary lesion of the midbrain, affecting the autonomic nervous system. The endocrine disturbances frequently reported are not an essential part of the disease but are due to derangement of the autonomic enervation of these glands. The endocrine dysfunctionings are seen most commonly in the less typical cases. The complicating central nervous system disorders are due to a more extensive involvement in the primary lesion. In some cases there is suggestive evidence that the primary lesion may be caused by an acute infection. In the majority of cases, however, there is no direct evidence of this. The natural course of the disease is fairly constant—with onset of symptoms appearing between the ages of 2 and 4 and progressing to inability to walk at between 8 and 12. In from four to six years more the use of the arms is lost, and death from an intercurrent infection occurs after another two to three years, at an age of from 15 to 20. Previous therapeutic measures have been almost uniformly without effect. Hypodermic injections of epinephrine and pilocarpine have been of

symptomatic temporary benefit in every case. In the extremely advanced cases this improvement has been of more scientific interest than of practical value. In hopelessly bedridden patients, definite increase of independence by the improved use of the arms has been obtained. In a comparatively early case, a symptomatic and functional recovery has been obtained. No claim can be made for the permanence of the improvement. It is the author's purpose to keep the cases under observation and report subsequently on their ultimate outcome.

Fusion of Knee in Charcot's Disease.—Cleveland and Smith report four cases of Charcot's disease of the knee in which operation was performed and in which solid bony fusion resulted in three and the results were highly satisfactory; i. e., the patients were able to walk without a brace or other support and had no instability in the knee. It is interesting also to note that firm union was present in one at four months, in another at five and one-half months and in the third at six months. This compares favorably with cases in which the fusion operation was done for other conditions, such as tuberculosis or stabilization of the knee in poliomyelitis. Not a little doubt was felt as to the possibility of obtaining bony fusion in a Charcot joint. Although this series is too small to justify any general conclusions, the results are sufficiently encouraging to warrant trying the operation in other selected cases. The fourth case, in which fusion did not take place and in which the wound broke down with the formation of sinuses, undoubtedly was too far advanced and the patient should not have been operated on. The patient's general condition was poor and, in addition to involvement of both knees, there was partial destruction of the metatarsal bones of one foot and a trophic ulcer. The technic used in these operations was that described by Hibbs for stabilization of the knee in poliomyelitis, and afterward employed for any condition in which arthrodesis of the knee is indicated, modified somewhat to meet the peculiar circumstances of each case. Weight-bearing in plaster was allowed at the end of from six to eight weeks.

Journal of Comparative Neurology, Philadelphia

53: 263-388 (Oct.) 1931

On Weight of Parts of Brain and on Percentage of Water in Them According to Brain Weight and to Age, in Albino and in Wild Norway Rats. H. H. Donaldson and S. Hatai.—p. 263.

Vascularity of Parts of Spinal Cord, Brain Stem and Cerebellum of Wild Norway Rat (Rattus Norvegicus) in Comparison with That in Domesticated Albino. E. H. Craigie, Toronto.—p. 309.

Studies on Diencephalon of Carnivora. D. McK. Rioch, Amsterdam.—p. 319.

Journal of Immunology, Baltimore

21: 255-340 (Oct.) 1931

Chemical and Immunologic Studies of Pneumococcus: II. Ether-Soluble Fraction of Type I Pneumococcus. A. Wadsworth and Rachel Brown, Albany, N. Y.—p. 255.

Statistical Study of Relative Goodness of Fit of Two Proposed Theories of Human Blood Group Inheritance. H. H. Strandskov, Chicago.—p. 261.

Random Mating and Blood Groups. R. L. Jenkins, Chicago.—p. 279.

Studies on Crystalline Urease: II. Hemagglutinating Properties of Urease. Margaret Hotchkiss and H. Tauber, New York.—p. 287.

Studies of Properties of Bouillon Filtrates of Meningococcus: Production of a Soluble Toxin. N. S. Ferry and J. F. Norton, Detroit, and A. H. Steele, Northville, Mich.—p. 293.

Quantitative Determination of Fixation of Complement by Immune Serum and Antigen. A. Wadsworth, Elizabeth Maltaner and F. Maltaner, Albany, N. Y.—p. 313.

Journal of Lab. & Clinical Medicine, St. Louis

17: 1-108 (Oct.) 1931

Physiology, Correlations, and Technic of van den Bergh Reaction, Icterus Index, and Quantitative Serum Bilirubin. N. W. Elton, Boston.—p. 1.

Catamenia and Oxygen Consumption. C. L. Wible, Lincoln, Neb.—p. 14.

Study on Series of Arthritic Patients Under Continuous Mono-Iodocinchophen Treatment with Especial Reference to Action of Cinchophen Molecule on Liver Tract. E. P. C. White, Philadelphia.—p. 17.

Diabetes Mellitus and Gastric Secretion. M. G. Wohl, Philadelphia.—p. 22.

Septic Cavernous Sinus Thrombosis: Two Cases with Recovery of One Following Bacteriophage Therapy. B. F. Stout, San Antonio, Texas.—p. 28.

Gonococcus Complement-Fixation Test in Synovial Fluid. D. H. Kling and J. Pinkus, New York.—p. 39.

Effects of Ultraviolet Irradiation on Reducing Power of Blood. L. M. Dillman, Chicago.—p. 44.

Journal of Preventive Medicine, Chicago

5: 303-410 (Sept.) 1931

Diphtheria Control in Bridgeport, Connecticut. W. F. Wild and Kathryn R. Tirrell, Bridgeport, Conn.—p. 303.

*Significant Differences in Racial Susceptibility to Measles, Diphtheria and Scarlet Fever: Statistical Study of Case Incidence and Deaths Among Tenement Dwellers in New York City, 1921-1925, Inclusive. H. Emerson, New York.—p. 317.

Typhoid Fever Spread by Water from a Cistern Contaminated by a Carrier. E. Garrido-Morales and O. Costa Mandry, San Juan, Porto Rico.—p. 351.

Meningococcus Meningitis in Detroit in 1928-1929: IV. Meningococcus Carriers. J. F. Norton and Irene E. Baisley, Detroit.—p. 357.

Id. V. Secondary Cases. J. F. Norton, Detroit.—p. 365.

Carrier Infection Among Family Associates of Diphtheria Patients. Y. Kusama, Baltimore, and J. A. Doull, Cleveland.—p. 369.

Effect of Heat, Storage and Chlorination on Toxicity of Staphylococcus Filtrates. E. O. Jordan, G. M. Dack and O. Woolpert, Chicago.—p. 383.

*Case of Food Poisoning Apparently Due to Staphylococcus. E. O. Jordan and J. R. Hall, Chicago.—p. 387.

*Experimental Study of Possible Routes of Contamination of Cakes with Food-Poisoning Staphylococci. G. M. Dack, O. Woolpert, Isabel Noble and Evelyn G. Halliday, Chicago.—p. 391.

Studies on Malaria: VIII. Migration of Infected A. Elutus at Various Seasons of Year. I. J. Kligler and G. Mer, Jerusalem.—p. 401.

Differences in Racial Susceptibility to Measles.—In a statistical study of case incidence and deaths among several race groups of tenement dwellers in Manhattan, borough of New York (1921-1925), Emerson found significant differences in the death and case incidence rates and in the case mortality percentages for diphtheria and scarlet fever, and in the death rates for measles, which do not appear to be explained by other factors than those of variations of susceptibility and resistance among the children of these races, under the approximately uniform conditions of contact exposure described. While unequivocal proof of specific race resistance cannot be offered by the statistical methods used in his study alone, the author believes that the factor of race is the only one of importance that can be recognized clearly as a variant of significance among the population groups studied.

Food Poisoning Due to Staphylococcus.—Jordan and Hall report an instance of food poisoning in a man and his wife who were suddenly taken ill with violent vomiting and purging accompanied by great prostration. The family consisted of three—the father and mother and a child about 9 years of age. The two adults, who had eaten gravy with the evening meal, developed severe symptoms in about three hours; the child, who did not eat gravy, showed no signs of illness. The gravy had been prepared on Tuesday from the leftover portions of canned chicken that had been served for Sunday dinner. The can bore the brand of a reliable, well known and nationally advertised firm. The chicken eaten on Sunday had caused no symptoms of any sort. In making the gravy, the bits of chicken meat and the broth or stock from the can were used. After preparation, the gravy had been kept in the icebox until Wednesday evening, when it was warmed and eaten at about 6 p. m. The gravy which was brought to the laboratory in the bowl in which it had been served the evening before, was normal in appearance and odor. Platings were made on plain agar, Endo medium and eosin-methylthionine chloride medium. No colonies suggesting those of the Salmonella group were found, but staphylococcus colonies were abundant on the plain agar. The general cultural characters of this staphylococcus were those of the common Staphylococcus aureus type. In pure culture the staphylococcus formed substances that, when swallowed by human volunteers, reproduced the typical picture of the original outbreak.

Contamination of Cakes with Staphylococci.—Dack and his associates report that staphylococci, introduced through inoculated egg whites or yolks into various cake batters of either the sponge or butter variety, were killed during the baking process. This was true in cakes of hydrogen ion concentrations ranging from 5.0 to 8.2. Staphylococci similarly introduced into a cream filler for cakes were destroyed during the cooking of the filler. Staphylococci inoculated into the filler after its preparation invaded the cake substance. Human feeding experiments showed that both the organisms and the toxic substance were present in the filler and in the cake itself. It therefore seems likely that, in some of the food poisoning

outbreaks due to staphylococci in cake, the filler is contaminated after its preparation, the microbes from the filler later invading the cake substance.

Kentucky Medical Journal, Bowling Green

29: 521-574 (Oct.) 1931

Epidemiology in Communicable Disease Control. J. L. Jones, Louisville.—p. 534.
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Tuberculosis of Joints. I. A. Arnold, Louisville.—p. 543.
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Anesthetist, Surgeon, Patient and Their Relationship. W. T. Dowdall, Paducah.—p. 550.
Roentgen-Ray Values to Practitioner of Medicine. D. Y. Keith, Louisville.—p. 552.
Diaphragmatic Hernia: Case Report. K. A. Fischer, Louisville.—p. 555.
Hemolytic Staphylococcus Septicemia, Autopsy Report and Case Summary. G. G. Altman, Louisville.—p. 558.
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Some Observations on Recently Discovered Endocrine Diseases. G. J. Hermann, Newport.—p. 561.
Transposition of Viscera: Case. D. C. Elliott, Louisville.—p. 563.
Acute Pancreatitis. J. H. Dunn, Arlington.—p. 564.
Present Trend in Treatment of Tuberculosis. H. M. Meredith, Scottsville.—p. 565.
Adult Tuberculosis. J. C. Graham, Webbs.—p. 567.
Hemorrhagic Disease of the New-Born. J. F. Standard, Elkton.—p. 568.
Carbonate of Guaiacol in Lung Affections. W. T. Baker, Louisville.—p. 570.

Laryngoscope, St. Louis

41: 663-732 (Oct.) 1931

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Acute Retropharyngeal Abscess: Cases. E. B. Brooks, Lincoln, Neb.—p. 671.
Observations on Paralysis of Recurrent Laryngeal Nerve. A. Michaelis, New York.—p. 687.
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Studies in Sinus Infection. J. W. Pugh, New York.—p. 697.
Foreign Bodies in Air Passages. G. R. Brighton, New York.—p. 702.
Primary Jugular Bulb Thrombosis: Metastatic Abscesses: Case. H. F. Lampe, New York.—p. 704.
Report of Operation for Removal of an Exostosis from Postero-Inferior Wall of External Auditory Canal. J. W. White, Norfolk, Va.—p. 706.
Two Unusual Cases of Labyrinthitis. C. M. Griffiths, New York.—p. 708.
Rare Pathologic-Anatomic Finding. V. Gakkel and A. Minkovsky, Leningrad, U. S. S. R.—p. 711.
Simplified Method for Correction of Dishface. J. W. Maliniak, New York.—p. 715.
Nupercaine, New Local Anesthetic, and Its Use in Nose and Throat Practice. A. F. Laszlo, New York.—p. 718.
Improved Powder Blowers for Applying Iodine Powder (Sulzberger). M. D. Lederman, New York.—p. 723.

Oklahoma State Medical Assn. Journal, Muskogee

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Silicosis. F. V. Meriwether and R. R. Sayers, Picher.—p. 317.
Legal vs. Physical Disability in Compensation Cases. W. H. Bailey, Oklahoma City.—p. 325.
Diagnosis and Treatment of Arthritis. E. K. Witcher, Tulsa.—p. 327.
Treatment of Fractures by Skeletal Traction. S. R. Cunningham, Oklahoma City.—p. 331.
Rationale of Vaccine Therapy in Chronic Infectious Arthritis. E. Goldfain, Oklahoma City.—p. 332.
Arthritis. W. P. Fite, Muskogee.—p. 335.
Operative Treatment of Unreduced Dislocated Elbow. D. H. O'Donoghue, Oklahoma City.—p. 337.

Public Health Reports, Washington, D. C.

46: 2481-2537 (Oct. 16) 1931

*Typhus Fever: Experimental Transmission of Endemic Typhus Fever of United States by Rat Flea Xenopsylla Cheopis. R. E. Dyer, E. T. Ceder, R. D. Lillie, A. Rumreich and L. F. Badger.—p. 2481.
Sickness Among Male Industrial Employees in Second Quarter of 1931. D. K. Brundage.—p. 2499.

Typhus Fever.—Dyer and his associates present experimental data showing that the rat flea (Xenopsylla cheopis) as a vector of endemic typhus meets the requirements of the epidemiologic evidence. The virus of endemic typhus has been recovered repeatedly from rat fleas taken at typhus foci, and, finally, experimental transmission of the virus from rat to rat by means of the rat flea has been carried out in the laboratory. The foregoing evidence points to the rat flea as a common vector of endemic typhus fever from rat to rat and from rat to man.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Heart, London

26: 1-67 (Oct. 7) 1931

*Centripetal Paralysis Arising Out of Arrested Bloodflow to Limb, Including Notes on Form of Tingling. T. Lewis, G. W. Pickering and P. Rothschild.—p. 1.
*Vasodilatation in Limbs in Response to Warming the Body: With Evidence for Sympathetic Vasodilator Nerves in Man. T. Lewis and G. W. Pickering.—p. 33.
Observations on Irresponsiveness and Refractoriness of Vessels of Skin. E. J. Wayne.—p. 53.

Centripetal Paralysis Arising Out of Arrested Bloodflow to Limb.—Lewis and his associates state that if the circulation to an arm is arrested, the limb after a time ceases to function owing to paralysis of its nerves. It is the nerve itself and not the nerve ending that is affected. Loss of tactile sense and of sense of position is early; it begins distally and spreads centripetally. Appreciation of pain, heat and cold is maintained much longer than is the tactile sense. The motor apparatus is affected in an order that is described and that is in general centripetal. Extensors become involved before flexors. The pilomotor nerves long retain their function. The sequence of loss of function is discussed in relation to the size of fiber involved. Recovery from ischemia is rapid and the order of recovery is the reverse of the order of involvement. The mechanism of centripetal paralysis is fully discussed on the basis of experimental work and evidence is brought to show that the nerves (sensory and motor) become more sensitive to ischemia as they are traced back from their endings toward the central nervous system. Evidence has not been obtained that ischemia produces conduction with decrement. The rate at which given nerve fibers cease to function is affected by their temperature. If nerve and muscle have been exposed equally to a toxic influence, and it is found that the muscle responds to direct stimulation but not to nerve stimulation, a conclusion that the neuromuscular junction is at fault is not justified. The fault may lie in the nerve trunk itself, as ischemic paralysis illustrates. A type of uniformly developing anesthesia resulting from pressure rendering short stretches of nerve trunks ischemic is described and contrasted with centripetal anesthesia. Subjective tingling occurring after the bloodflow to an arm has been arrested and released is due to a certain state of recovery of the fibers of the nerve trunks and is referred to the periphery. There is evidence tending to suggest that it is an affair of the tactile nerves; it is referred to the territories of the fibers that are most affected by circulatory arrest, namely, those supplying the fingers. The observations and experiments described are applicable to clinical cases from several points of view. First, they lay stress on a special form of sensory and motor palsy here termed "centripetal." It is well known of peripheral neuritis, arising out of various forms of poisoning, that the disturbances of sensation and the loss of power appear first in the distal parts of the limbs, that on the motor side the tendency is for the extensors to become affected before the flexors, and that the symptoms in progressing invade more proximal parts of the limb and that the trunk remains relatively immune. In these forms of neuritis, all parts of the body are exposed to a toxic agent but there is discrimination. The form of paralysis resembles in type the one studied, and it is difficult to believe that they are brought about in ways that differ fundamentally. It is suggested that the common factor is increased susceptibility of the nerve fiber to certain forms of damage as it is traced away from its peripheral ending. It is further suggested that it may be proper to regard numbness developing in the finger tip and weakness or paralysis of distal muscles in the limb, more rigidly than these symptoms have been regarded hitherto, as evidences of a disorder of the peripheral nerves. In the same connection it may be profitable to consider whether tingling of the precise form described is or is not a symptom characteristic of a specific type of change in the peripheral sensory (and especially tactile) nerve paths. Secondly, the observations establish the time relations of numbness and other symptoms of nerve damage arising out of vascular obstruction on a reasonable basis. If a clot lodges in the main artery of

a limb, obstructing it, or if the main arteries of a finger or of a larger part of the limb enter into a spasm sufficiently intense to arrest the bloodflow, sensory and sometimes motor disturbances occur in the corresponding territory. They are of centripetal type and from the standpoint of forming an exact parallel to the paralysis observed do not require further comment. It is important to understand that such disturbances do not develop at once, but after intervals of time that depend on the length and temperature of the nerve that has lost its blood supply. To illustrate, it is often stated by patients, and seemingly believed by many who report such cases, that, in Raynaud's disease, fingers become white and numb at the time the circulation to them is lost; and this numbness has even been regarded as an evidence of a primary disturbance in the nervous system. Such views are proved erroneous by the authors' observations; the numbness is due to arrested bloodflow, and occurring in cold fingers appears only after a long delay. When a patient states that fingers that have been warm previously become dead, meaning numb, in cold weather, the numbness is evidence that the blood has ceased to flow to the fingers for a time period of the order of one hour. Similarly, if a patient complains of pain in the leg and within five minutes the leg is found to be numb and to have lost the pulsation of its vessels, it is certain that the obstruction preceded the pain by many minutes. Statements that limbs suddenly become white (or pale) and numb should be regarded critically until such incidents are more fully and accurately recorded.

Vasodilatation in Limbs in Response to Warming the Body.—According to Lewis and Pickering, a simple method of testing the capacity of arteries of the extremities to dilate is to note the reaction in the cool extremity when the body is exposed to a warm atmosphere. In the hand, vasodilatation so induced manifests itself first by a rise of temperature and by brightening in the color of the finger tips. The time at which the response begins is influenced by the initial temperature of the extremities, being delayed by coldness. The response is effected entirely through the sympathetic nerves. By studying the reaction in Raynaud's disease and comparing the effects of ulnar anesthesia, the authors obtained evidence that the human sympathetic nerves contain vasodilator as well as vasoconstrictor fibers. The warm chamber is valuable clinically in differentiating obstruction arising from spasm and from structural disease of the arteries. In the former the response is rapid and proceeds to a high level. In the latter the response is slow and less pronounced. The chamber can also be used in determining that the sympathetic innervation of vessels of the limb has been lost.

Lancet, London

2: 833-886 (Oct. 17) 1931

*Some Principles in Surgery of Pharynx. W. Trotter.—p. 833.
*Size of Healthy Heart and Its Measurement. D. E. Bedford and H. A. Treadgold.—p. 836.
*Cerebral Tumor as Cause of Generalized Epileptic Attacks of Long Standing. E. A. Blake Pritchard.—p. 842.
*Occurrence of Scarlatinal Types of Streptococci in Nonscarlatinal Infections. V. D. Allison.—p. 844.
Case of Multiple Personality. R. M. Riggall.—p. 846.

Surgery of Pharynx.—Trotter calls attention to the fact that the mortality of operations for malignant disease of the pharynx is considerable, whether the actual treatment of the growth is by excision or by radium. The chief factor in this mortality is infection either of the lungs or of the extrapharyngeal tissues but in any case due to access of the pharyngeal contents to the infected part. The actual conduct of the operation can undoubtedly reduce the risk of such infections, but it cannot ever exclude it with certainty. While therefore every step of the operation will be oriented toward the limitation of infection, other means must be found of a more general usefulness if the mortality is to be kept below a level prohibitively high. The infection that follows contamination of a wound by pharyngeal mucus has clinical features and a clinical course that are characteristic. It is a progressive sloughing cellulitis, nonsuppurative for several days, accompanied by moderate fever for eight to ten days, when suppuration and the separation of sloughs begin. It is intolerant of the least restraint of drainage and always involves a risk of serious secondary hemorrhage. Clinical experience proves that the cause of this characteristic infection is always present in those who have teeth whether the teeth are many or few, or with or without obvious disease; it also proves that in the edentulous the cause of this infection tends to disappear or to be greatly attenuated. Thus, in the aggregate the risks of major operations on the pharynx are greatly reduced in the edentulous, and there is no general precaution in the preparation of a patient for such an operation that can compare in value with a clearance of the mouth and a delay until the gums are soundly healed. There are few facts of clinical surgery more firmly established than this relation between the presence of teeth and the liability to sloughing infections of wounds to which the oral or pharyngeal mucus has access; there is certainly none so unquestionably true that is so little valued and acted on. So much is this the case that it is necessary to speak of the subject with emphasis and without ambiguity. It is doubtful whether a major operation on the pharynx is ever justifiable in any but an edentulous patient. This question is quite different from that of clearing the mouth to produce an effect on some general or distant disease. One is not concerned with anything so problematic but with the attempt to get the pharynx into a condition as near surgical cleanliness as one can, and no other precaution for such a purpose has any claim to compare with this one. It is necessary to lay stress on the fact that if the relative sterility of the mouth is a most important preliminary to any major pharyngeal operation, it is doubly important if radium is to be used. It is perhaps because radium is sometimes regarded as having simplified the treatment of malignant disease of the pharynx that there is a tendency to disregard the stringent necessity for every precaution against infection when it is used. If it is questionable whether any major operation on the pharynx should be done except in the edentulous there can be no doubt that if radium is to be used this precaution is essential to reasonable safety.

Size of Healthy Heart and Its Measurement.—Bedford and Treadgold believe that location of the apex beat by palpation is the most reliable clinical method of measuring the heart, and orthodiagraphy is the simplest and most accurate roentgenologic method. The total transverse diameter is the most reliable index of heart size for practical purposes. The transverse diameter varies directly with body weight but not with height. At any given weight, the transverse diameter varies inversely with height. Short, broad subjects have wider hearts in proportion to body weight than tall, slender subjects. The normal transverse diameter may be predicted with reasonable accuracy from body weight in those whose height is ideal for their weight. In others both height and weight must be taken into account in predicting heart size. The observed transverse diameter expressed as a plus or minus percentage of that predicted from weight and height is the best way of indicating heart size. If one takes into account both weight and height, about 85 per cent of normal hearts fall within a range of plus or minus 10 per cent of the predicted normal, and less than 10 per cent of hearts exceed the upper limit of plus or minus 10 per cent. Measurements cannot be applied as a rule of thumb method in separating healthy from diseased hearts, but must be considered in relation to the clinical data. In borderline cases changes in the shape of the heart silhouette, viewed from different angles, are likely to be of more value than measurements.

Cerebral Tumor as Cause of Generalized Epileptic Attacks.—Pritchard reports five cases which show that it is possible for a cerebral tumor to give rise to generalized convulsions and to status epilepticus for many years (in one case for eighteen years) before any other signs indicating a local cerebral lesion are detected. In general it may be stated that such tumors are slow-growing and do not originate in, but beneath, the cerebral convolutions. The seizures cannot be rightly regarded as resulting from a rise in intracranial pressure, since they may be present for many years before other signs of such a rise are present, and also because they do not increase either in frequency or in severity when a rise in intracranial pressure later supervenes. The inference drawn from these considerations is that when convulsions commence and occur repeatedly in persons of middle age—even though the convulsions are generalized in character and do not leave behind them local impairment of function—they should be regarded as possibly resulting from an intracranial tumor and the patient should be kept under repeated observation, which may only

after several years discover definite signs indicating the nature of the lesion.

Scarlatinal Types of Streptococci in Nonscarlatinal Infections.—Out of a total of 396 strains of hemolytic streptococci, isolated from nonscarlatinal infections, Allison found that only eight (2 per cent) belonged to one or other of the four main serologic types of scarlatinal streptococci. The results indicate the high degree of specificity of the scarlatinal streptococci, as 63 per cent of hemolytic streptococci from scarlatinal patients can be typed serologically. Among the eight typed strains, a type I strain and type III strain were isolated from uterine cervical swabs in cases of puerperal infection, while a type I strain and a type III strain were isolated from throat swabs of midwives in attendance on the respective patients. These results corroborate those recently shown by Smith and support the view of many clinicians that puerperal infection may arise by infection from the air passages of persons in attendance on the patients. From 100 consecutive cases of diphtheria and 100 consecutive cases of measles, 62 strains and 32 strains, respectively, of hemolytic streptococci were isolated, but none were placed in any of the main serologic types of scarlatinal streptococci.

"Gann," Japanese J. Cancer Research, Tokyo

25: 131-222 (Sept.) 1931

*Strictly Cell-Free Transmission of Rous Chicken Sarcoma. W. Nakahara and H. Nakajima.—p. 131.
Heteroplastic Transplantation of Artificially Produced Skin Cancer of Mice. S. Itô.—p. 141.
An Interesting Case of Melanoma. M. Hirai.—p. 191.

Transmission of Rous Chicken Sarcoma.—By means of the capillary method and of the application of the micro-isolation technic, Nakahara and Nakajima were able to test the tumor-producing action of that portion of the Rous sarcoma filtrate which had been directly examined and found to be free from cells. With the capillary method, the proved cell-free filtrates produced sarcoma in two out of nine chickens, or two out of eighteen inoculations, while with the micro-isolation method as many as thirteen out of thirty-two inoculations (seven out of sixteen chickens) resulted in tumor production. The larger percentage of tumors in the latter experiment is traceable to the larger amount of filtrate injected. Positive tumor production by inoculation of minute amounts of chicken sarcoma filtrate directly examined and proved cell-free vindicates the long and generally held supposition that this class of tumors can be transmitted without the intervention of intact cells. Thus the last cloud of doubt as to the cell-free transmissibility of the Rous sarcoma, and consequently as to the existence of a causative agent distinct from sarcoma cells recognizable as such, has been removed.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

47: 1511-1534 (Oct. 26) 1931

*Homolateral Atrophy of Mammary Gland in Course of Artificial Pneumothorax. E. Rist and P. Véran.—p. 1511.
Parathyroid Adenoma with Metastases: Case. J. A. Lièvre and P. Muller.—p. 1515.
Heredosyphilitic Familial Hepatosplenomegaly: Therapeutic Test. M. Pinard.—p. 1523.
Hepatic Manifestations in Course of Encephalomeningeal Diseases. C. Richet, Jr., A. Jacquelin and F. Joly.—p. 1528.

Atrophy of Mammary Gland and Artificial Pneumothorax.—Rist and Véran describe their experiences in which six women, out of a total of ninety patients with pulmonary tuberculosis treated by artificial pneumothorax, developed an atrophy of the mammary gland on the side of the pneumothorax. There was present not only a displacement of the gland, which is common to contraction of the chest, but in addition actual atrophy of the glandular lobules. The atrophy was evident from the first, but when more or less masked by the neighboring tissue its extent was determined by palpation. The patients themselves noticed this complication during the first months of collapse therapy or several years after the beginning of the insufflations. The condition was slowly but regularly accentuated and the glandular mass was reduced to more than half of the original size. The condition was independent of the type of the primary pulmonary lesion or the side of the chest affected. In most instances, the pneumothorax had been complicated by febrile, prolonged, recurrent, tenacious effusions. In every case there was contraction of the chest, with intense thoracic retraction, pleuricostal depressions and dextrocardia or sinistrocardia. The atrophy of the mammary gland was independent of ovarian function and all other endocrine disturbances. The authors did not doubt the relationship of cause and effect between the pleuropulmonary and thoracic retraction on the one hand and the glandular atrophy on the other hand. They were not able to determine the actual anatomy and physicopathology of the complications but believed that the condition was due to elective lesions of the sympathetic or cerebrospinal fibers, separately or together; the neuritis of the intercostal nerves, by reason of a probable pleurogenic irritation, may have been responsible for the homolateral atrophy of the mammary gland. This trophic disturbance is unlooked for in the course of pneumothorax therapy.

Presse Médicale, Paris

39: 1517-1532 (Oct. 17) 1931

*Importance of Sympathetic System in Metabolism. E. Leschke.—p. 1517.

Importance of Sympathetic System in Metabolism.—Leschke discusses the various hypotheses on the etiology of diabetes insipidus, sugar diabetes, and disorders in fat metabolism. His observations are contrary to the theory that the hypophysis is the etiologic factor in diabetes insipidus. Hypophyseal alterations when present are secondary factors to the rôle of the thalamencephalon, which acts through the central sympathetic nervous system in the regulation of water-mineral metabolism. The endocrine factor in pancreatic diabetes is given second place to the sympathetic nervous system, since the production of insulin itself is regulated by the sympathetic system. His observations prove that pancreatic diabetes does not depend on the amount of insulin secreted or parallel the changes in the islands of Langerhans. The assertion is made that polyuria is almost always a sign of disorder in the plurisympathetic regulation of water and mineral metabolism. Constant chloride retention in diabetes is an indication of aggravation of the conditions in metabolism; and a sudden diminution of chlorides is a forewarning of coma. There is also a relationship between arterial pressure and diabetes. Idiopathic hypertony may cause the appearance of sugar in the blood and alimentary glycosuria. The author breaks down the old theories that named the hypophysis as chief cause and substitutes the diencephalon as a factor in adiposogenital dystrophies as well as obesity in general. Endogenous obesity is designated in this classification as a symptom of vagotonia. The author designates as plurisympathetic many regulatory disorders of the diencephalon in which diabetes insipidus may be combined with disorders in sugar metabolism, regulation of temperature, obesity, hypertony and polyuria, as well as regulation of the basic instincts.

Revue Française d'Endocrinologie, Paris

9: 259-342 (Aug.) 1931

*Association of Vagotonic Pancreatic Extract (Vagotonic Hormone) with Insulin in Diabetes. D. Santenoise, T. Brieu, G. Fuchs, P. Louyot and M. Vidacovitch.—p. 259.

Vagotonic Pancreatic Extract and Insulin in Diabetes.—Santenoise and his co-workers have shown that the pancreas plays an important part in the regulation of reflex excitability and pneumogastric tonus. The pancreas introduces into the circulation a substance that regulates the activity of the vagus nerve. Purified insulin is not vagotonic as is usually believed; that property is a function of another hormone. They have extracted from the pancreas a substance presenting all the characteristics of true hormones and endowed with considerable pneumogastric activity. The substance differs from insulin in biologic, chemical and physicochemical characteristics and has been designated by Santenoise in 1922 as a pancreatic vagotonic hormone. Insulin demonstrated vagotonic properties when it was not pure and contained the accessory hormone. This vagotonic hormone seems to be a regulator of glycogen through its influence on the vagus nerve. There is a dual action in the glycoregulatory hormones of the pancreas; the vagotonic hormone regulates the anabolism and insulin the catabolism of

carbohydrates. The addition of the hormone increases the action of insulin. Their glycoregulatory action is synergistic and complementary. The results obtained when the two hormones were associated in the treatment of diabetes were conclusive. In summary, the addition of the vagotonic hormone to insulin in the treatment of some diabetic persons increased the glycoregulatory function of the pancreatic extract, the quantity of insulin necessary was diminished and the number of daily injections sometimes cut to one; increased carbohydrate tolerance made possible an increased intake of sugar; the glycosuria and acetone bodies disappeared; the lipoid and protein metabolism was improved; there was an increase in weight and an improvement in the general body condition. More than thirty patients with diabetes were treated in this way. The authors believe that their results recommend the association of the vagotonic pancreatic extract with insulin in the treatment of diabetes.

Sang, Paris

5: 513-640, 1931

*Leukemias with Tumors. P. Emile-Weil and P. Isch-Wall.—p. 513.
Clinical, Hematologic and Histologic Observations in a Case of Leuko-Erythrophthisis. N. C. Lupu and G. C. T. Nicolau.—p. 530.
Thrombopenic Hemorrhagic Diathesis with Severe Secondary Anemia. J. V. Grott and L. Galinowski.—p. 547.

Leukemias with Tumors.—Emile-Weil and Isch-Wall believe that (1) leukemias with tumors are acute leukemias; (2) the appearance of osseous, cutaneous or lymph node tumors in the course of a chronic leukemia announces the transformation into acute leukemia with a rapidly fatal prognosis. When the acute stage has appeared, all treatment that might lead to destruction of leukocytes, roentgen rays, or benzene should be discontinued, and purely palliative and symptomatic therapeutics retained. Continuation of active therapy only helps to precipitate the evolution with consequent acute hemorrhagic accidents. The authors review five cases including an acute leukemia with a primary tumor of the mediastinum, a chloroma diagnosed as acute leukemia, two cases of acute leukemia with tumors of the lymph nodes subsequent to myeloid leukemia, and one case of acute leukemia with cutaneous tumors subsequent to myeloid leukemia.

Prensa Médica Argentina, Buenos Aires

18: 437-486 (Sept. 10) 1931

Obliteration of Peripheral Vessels. M. Bastos Ansart.—p. 437.
Postencephalitic Sclerosis with Plaques Associated with Tubero-Infundibular Syndrome. A. F. Camauër and J. I. Sacon.—p. 448.
*Fat Necrosis of Subcutaneous Tissues. D. Mosto.—p. 452.
Therapeutic Action of Drainage of Bile Ducts. H. A. Zunino.—p. 472.

Fat Necrosis of Subcutaneous Tissues.—Mosto reviews the literature on fat necrosis of the subcutaneous tissues and reports ten cases in new-born infants, children and adults. The lesions do not show an elective localization since they may develop in the subcutaneous tissues of the mammary gland, abdomen and muscles, particularly in the muscle regions in which oil injections are given. From his observations the author concludes that fat necrosis of the subcutaneous tissues is similar in adults, children and infants. The following are its principal types: (1) primary (aseptic) necrosis of spontaneous development (which is caused by disturbances of the fat metabolism) and (2) necrosis secondary to trauma or to inflammatory processes. The form of diffuse nodular fat necrosis of the subcutaneous tissues of the new-born infant and of children may be either of the first or of the second type. From the anatomic and pathologic points of view, the lesion is similar to lipoid granulomas caused by injections of oil or some other liquid or by the presence of collections of cholesterol. In the anatomicopathologic observations the saponification of the fat and the formation of granulation tissue are evident. In the genesis of the tumors, both predisposing and determining factors are involved. The outstanding predisposing factor is a condition of special tendency, governed by the endocrine and the sympathetic nervous systems, which certain organisms have to develop the disease. Trauma, hemorrhage, ischemia, vascular lesions, inflammatory processes and the presence of toxins in the organism are the most frequent determining causes of the development of the disease.

18: 487-536 (Sept. 20) 1931

Intra-Articular Endothelioma Arising from Synovial Membrane: Case. J. Diez.—p. 487.
*Syndrome of Anterior Condyloid Foramen and of Foramen Lacerum Posterius: Case. C. Pinedo.—p. 501.
Lowering of Hyperchlorhydria After Gastric Resection According to First Method of Billroth. F. Basch.—p. 505.
Therapeutic Action of Medical Drainage of Bile Ducts. A. Zunino.—p. 521.

Syndrome of Anterior Condyloid Foramen and of Foramen Lacerum Posterius.—Pinedo states that the syndrome of the anterior condyloid foramen and of the foramen lacerum posterius (paralysis of the last four cerebral nerves) is uncommon. He could not find any reference to the syndrome previously published in Argentina. Vernet in 1916 compiled fourteen cases from the literature. In the author's case, clinical and anatomopathologic observations were made. In the case under his observation the syndrome proved to be caused by compression of the glossopharyngeal, the vagus, the accessory and the hypoglossal nerves of the right side, produced by a myelosarcoma arising from the transverse processes of the first and second cervical vertebrae, with extension to and destruction of nearby structures. The author describes the mechanism of the syndrome in detail, thus explaining the whole picture given by the syndrome: anesthesia of the velum palatinum, anesthesia and paralysis of the pharynx, the larynx and the tongue, dysphagia, disturbances of the voice and of the taste, and respiratory disturbances with grave asphyxia, all the symptoms undergoing a progressive evolution to a fatal outcome.

Semana Médica, Buenos Aires

38: 865-944 (Sept. 17) 1931. Partial Index

Combined Orthopedic and Rest Treatment in Pott's Disease. J. M. Jorge, M. Gamboa and J. Dietsch.—p. 873.
Hematoma of Sheath of Optic Nerve After Trauma. A. J. Manes.—p. 878.
*Milk in Infant Feeding. E. Foster.—p. 891.
Primary Sarcoma of Lung in Infant. J. G. Fernández and M. A. Carri.—p. 907.
Hemolytic Anemia of Old Persons: Case. J. C. Rey.—p. 912.
*Multiple Perforations of Small Intestine by Bullet. J. A. Luco and J. Passerini.—p. 921.

Milk in Infant Feeding.—Foster believes that breast feeding is the best alimentation for nurslings. He made a chemical analysis and a comparison of effects of breast milk, cow's milk and ass's milk. The content of lactalbumins in breast milk and in cow's milk is similar (5.2 and 5.5 Gm. per thousand cubic centimeters, respectively), while in ass's milk it is higher (8 Gm. per thousand cubic centimeters). The number of calories produced by breast milk and by cow's milk is 761 and 676, respectively, while that given by ass's milk is 500. The author (basing his observations on the results of his studies on problems of anabolism and catabolism of the elements of the three kinds of milk, in relation to digestive ferments and enzymes, as permitting a better assimilation of the nutritious elements of milk by the infant's digestive apparatus) regards cow's milk as the most satisfactory substitute for breast milk whenever the latter is not available. Raw cow's milk may contain pathogenic bacteria (including tubercle bacilli); it is difficult to digest and therefore causes intestinal disturbances. To make it more easily assimilable and safer for infants, one should properly modify it, trying, however, to keep the concentration of its elements in the most approximate proportion to that in breast milk. When used in artificial feeding, it should be boiled, mixed with an equal amount of water and then enriched by the addition of cream or carbohydrates (saccharose or common sugar), to compensate for the loss of its nutritious value which it undergoes through dilution and boiling. The addition of cream (as representative of fatty substances) may be higher in winter than in summer. Evaporated milk and dried milk, because of their avitaminic properties, if used in artificial feeding should be given either temporarily or as a supplementary food to breast milk or to cow's milk.

Multiple Perforation of Small Intestine by Bullet.—Luco and Passerini advise the performance of an abdominal operation immediately on admission of patients who have received a bullet wound, when there are good reasons to suppose that the bullet has penetrated the abdominal cavity, even

though peritoneal or abdominal symptoms may be absent. Their patient, aged 28, received a shot in the right inguinal region. There was not any opening showing the exit of the bullet. (Besides the abdominal wound, the patient had also received other wounds in his head, with a knife, and on admission he was in a grave condition of anemia and shock due to the hemorrhages from the wounds. This grave condition, however, was controlled.) Roentgen examination showed the presence of the bullet in the symphysis pubis. Five hours after the patient was wounded, operation was performed. A large hematoma in the suprapubic and retropubic regions and in the perivesical space, behind the symphysis, was found after the performance of an infra-umbilical laparotomy. The hematoma was eliminated, and the bullet was removed from the symphysis pubis. The authors thought that the patient had received an extraperitoneal wound, but on opening the abdominal cavity they found that the small intestine had four perforations in a segment about 30 cm. long. The perforations were sutured, and the operation was finished after two drainage tubes had been inserted. The patient did well and was discharged twenty-nine days later in good condition.

Archivio Italiano di Urologia, Bologna

7: 3-112 (Sept.) 1931

*Pyelography. S. Zanetti.—p. 3.
Experimental Aspergillar Ureteropyonephrosis in Connection with Ureterectasis. F. Leinati.—p. 55.
*Desensitization of Organism Toward Disturbances Following Spinal Anesthesia in Urinary Surgery. A. Vitale.—p. 67.
Bilharzia Infection of Renal Pelvis: Case. A. De Luca.—p. 74.
Value of Indican Determination in Blood for Functional Exploration of Kidney. L. Serra.—p. 85.
Experimental Hydronephrosis and Pyelovenous Backflow. V. Ghiron and C. Giacobbe.—p. 91.

Pyelography.—Zanetti admits that his experience has not been so extensive that his conclusions have the character of finality. The method that up to the present has been found entirely harmless appears to the author satisfactory. It is certainly rare to see in pyelograms such excellent and distinct images as are secured with ascending pyelography. But irrespective of the value of the method there remains always a field that belongs to intravenous pyelography. In this field are included all the cases (and they are many) in which ascending pyelography is impossible. The two methods, then, do not exclude but supplement each other. Descending pyelography cannot pretend to replace the old methods of research; it merely supplements them and collaborates with them in establishing a diagnosis. The author recommends whenever possible an examination by means of endovenous pyelography, as a preliminary inquiry. Later, if it is impossible to reach a definite conclusion otherwise, he supplements the information furnished by the first method by the use of the ordinary method of pyelography. The author recalls the words of the French physician Papin uttered at the congress of the French Urologic Society, May 13, 1929: "It is not with impunity that we inject into the urinary organs massive solutions of bromide and iodide, for, when one operates immediately afterward, one finds that the damage is sometimes considerable."

Desensitization of Organism Toward Disturbances Following Spinal Anesthesia in Urinary Surgery.—Vitale explains a new prophylactic treatment with reference to the mild and the grave disturbances resulting from spinal anesthesia, as presented by patients subjected to various operations on the urinary passages. Comparing his observations following the use of his method in 100 persons subjected to spinal anesthesia for various surgical interventions on the urinary passages with the results secured in the same number of patients subjected to various surgical interventions on the urinary tract, in which the method was not applied, he demonstrates the great value of the method, which consists in the intravenous injection, just prior to the beginning of the operation, of 10 cc. of cerebrospinal fluid, which is withdrawn before the injection of the anesthetic. The mechanism of the action consists doubtless in the fact that the fluid, introduced into the blood stream, produces a desensitization of the organism, whereby the appearance of the disturbances (often grave and sometimes fatal) that may follow spinal anesthesia is prevented.

Clinica Chirurgica, Milan

34: 825-952 (Aug.) 1931

*Changes in Sugar Content of Blood and Cerebrospinal Fluid in Persons Suffering Cranio-Encephalic Injuries. P. Cazzamali.—p. 825.
Chloruremia and Chlororrhachia Associated with Craniocerebral Traumas. M. Tabanelli.—p. 844.
Influence of Kidneys on Alkali Reserve in Traumatic Shock. G. Augi.—p. 858.
*Collateral Cerebral Circulation After Ligation of Large Veins of Neck. M. Romeo.—p. 881.

Changes in Sugar Content of Blood and Cerebrospinal Fluid in Persons Suffering Cranio-Encephalic Injuries.—Cazzamali studied in twenty-seven patients the influence that cranio-encephalic traumas may exert on carbohydrate exchange. In fifteen patients he determined the behavior of the sugar content of the cerebrospinal fluid. From the results secured he concludes that all such traumas, if fairly severe, provoke transient hyperglycemia, the degree and significance of which are in relation to the mechanism of the traumatic action, the violence of the impact and, particularly, the depth and duration of the loss of consciousness and the degree of cranial hyperpressure. A constant relation cannot, however, be deduced from the site and nature of the bone lesions. As regards the sugar content of the cerebrospinal fluid, he found, in the main, normal values, although in some cases there was a diminution, and only in one case an increase. The diminution may possibly be attributed to the sugar-burning action of the blood elements thrown into the cerebrospinal fluid, and to the fact that the determination was made soon after the trauma. The study of the sugar content of the cerebrospinal fluid at later intervals makes it appear probable that in course of time the glycorrhachia increases under the direct influence of the posttraumatic hyperglycemia.

Collateral Cerebral Circulation After Ligation of Large Veins of Neck.—Romeo, in a series of experimental researches on dogs, studied the behavior of the peripheral arterial pressure and of the blood flow per minute, measured on the internal carotid artery, following the ligation of the left common carotid, and then also of the vertebral artery—isolated or associated with the ligation of the jugularis externa and the jugularis interna on the same side. He observed that the ligation of these veins leads in every case to a sensible increase not only of the arterial pressure but also of the blood flow. The increase is, however, a transient manifestation, since, after a time, the hydrodynamic equilibrium of the brain tends to become reestablished, and also the peripheral arterial pressure and the blood flow tend to return to primary values. The experiments performed by the author to show the formation of the collateral cerebral circulation, by injecting a radiopaque mixture into the carotid artery of the side opposite to that of the ligation, demonstrated that in the cases of the simultaneous ligation of the arteries and of the veins the disposition and the development of the arterial network were almost uniform in the two cerebral hemispheres; whereas in the three experiments of isolated ligation of the left carotid artery the corresponding cerebral hemisphere always appeared less injected than the right hemisphere, as was substantiated also in the two animal controls in which the injection of the radiopaque mixture into the right carotid was made without ligation of the left-side vessels.

Riforma Medica, Naples

47: 1395-1432 (Sept. 14) 1931

Undulant Fever and Hemorrhagic Diathesis. C. Cassano.—p. 1395.
*Action of Iodine in Experimental Arteriosclerosis. H. Liebig.—p. 1400.
Traumatic Chylothorax. R. Spaccialbello.—p. 1402.

Action of Iodine in Experimental Arteriosclerosis.—Liebig's researches were on cholesterinic arteriosclerosis in the rabbit, which was induced by a linseed oil-cholesterol mixture. The vascular lesions developed in all the experimental animals, with predominant localization in the aorta. With the weak doses of the special iodine preparation, as at first administered, no modifications in the changed vascular system were brought about. However, with doses of from 50 to 100 mg. of iodine a day, per kilogram of body weight, it was possible to influence the vascular lesions, so that in 75 per cent of the animals either no lesions or no lesions of importance were found. It cannot be stated with certainty as yet whether, and if at all, to what extent, the experimental results are applicable to man.

Archiv für Kinderheilkunde, Stuttgart

94: 81-240 (Sept. 11) 1931

Investigations on Immunobiology of Pneumonia. E. Kramár.—p. 81.
*Significance of Electrocardiography for Prognosis of Diphtheria. P. von Kiss.—p. 97.
Toxicity of Several Ergosterol Preparations. O. Göttche and B. Kellner.—p. 129.
Metabolism of Healthy Infants Fed with Vegetable Milk. Maria Niermann and Margot Winter.—p. 146.
Studies on Pneumonia During Childhood: Pleural Empyema. R. Kochmann.—p. 159.
*Tonsillectomy and Schick Reaction. D. Orosz and G. Kugler.—p. 168.
Diphtheria Vaccinations, Schick Tests and Determination of Antitoxin Titer in Serum. H. Thiele.—p. 175.
Pneumothorax Apparatus with Simple Manipulation for Use in Pediatrics. L. Dobszay and I. Salamon.—p. 202.
Combined Serum and Calcium Therapy in Diphtheria. E. Kaesper.—p. 205.
Polypus on Rim of Choana in Small Child. K. Rupilius.—p. 209.

Electrocardiography for Prognosis of Diphtheria.—Von Kiss maintains that for a correct prognosis in malignant diphtheria and for determining the condition of the heart it is necessary to resort to electrocardiography. However, a single test is rarely sufficient, for only when the examination is repeated is it possible to detect progressive deterioration of the cardiac condition. In patients with diphtheria a dysfunctioning of the heart is indicated by lowered ventricular complexes, by depression of the T and P deflections in at least two leads, by extension of the T deflection, and especially by eventual omission of the T and P deflections; also by disturbances of the Q-R-S complex in at least two leads. If these abnormalities become more marked in the later tests, or if the curve presents the aspects of complete muscular dysfunctioning, the prognosis is usually unfavorable, even when the clinical signs do not indicate a dysfunctioning of the heart. The author gives several case histories and illustrates them with electrocardiographic charts.

Tonsillectomy and Schick Reaction.—In studies on 161 tonsillectomized children, aged between 1 and 6 years, Orosz and Kugler found that contrary to the theory of a relationship between tonsillectomy and the Schick reaction, which was advanced by Tomlin and later corroborated by Schick and Topper as well as by several others, they did not observe any relationship whatever between the two. On the contrary, they observed an increased susceptibility to diphtheria rather than a reduced susceptibility. Neither did the authors find a relationship between the aftergrowth of the tonsils and the behavior of the reaction. They think that the fluctuations in the negativity of the Schick reaction are largely due to the epidemiologic conditions existing at different times, and they think that the results which Schick and Topper ascribe to tonsillectomy may be due to some of these incalculable external factors. The practical conclusions which Schick and Topper arrived at from their theory, namely, to resort to tonsillectomy instead of to immunization, and to test tonsillectomized children before immunization in order not to give superfluous treatment, are likewise rejected by the authors.

Deutsche Zeitschrift für Chirurgie, Berlin

232: 701-792 (Sept. 5) 1931

Bone Transplantation: Experimental Studies and Application in Practical Surgery. S. Orell.—p. 701.
*Traumatic Nephritis. F. Schörcher.—p. 714.
Clinical Aspects of Subcutaneous Injuries of Abdominal Organs by Blunt Force. J. Jáki.—p. 724.
Bacteriologic Investigations on Major and Minor Omentum in Ulcer and Cancer of Stomach. H. Weber.—p. 747.
Distention Ulcer of Intestine (Kocher). Reichel.—p. 758.
Congenital Microcolon. E. Drost.—p. 764.
Chronic Appendicitis. E. Prass.—p. 767.
Evaluation of Modern, Artificial Illumination of Operating Room. Drüner.—p. 769.

Traumatic Nephritis.—Schörcher reports the clinical history of a man in whom bilateral glomerular nephritis developed after a trauma, which the man sustained by a fall over a pole, while ski-running. The nephritis resulted in a contracted kidney. The author further discusses the various conditions that may cause nephritis and also the relations between trauma and nephritis, and he thinks it possible that a trauma may be the only cause of a nephritis. He considers three possibilities in which a traumatic nephritis may develop: by a prolonged spasm of the renal vessels, by formation of nephrotoxins and by a local reduction of the resistance power. It is also possible that all these factors combined lead to nephritis.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

89: 1-160 (Sept.) 1931

Influence of Inferior Ovaries on Offspring. J. Bondi.—p. 1.
*Fetal Birth Traumas and Their Treatment. S. Liebmann.—p. 14.
*Significance of Retroplacental Blood for Detection of Syphilis. W. Hilden.—p. 32.
*Sure Sign of Hypermaturity in the New-Born. F. Szellő.—p. 35.
Evaluation of Clinical Obstetrics. M. K. Wenzbowsky.—p. 44.
Diseases of Female Genitalia Caused by Bacillus Coli. Becker.—p. 49.
Use of Alcohol Injections in Gynecology in Treatment of Dysmenorrhea, Hemorrhoids and Hypoplasia. R. Hofstätter.—p. 59.
Influence of Pregnancy and of Gynecologic Diseases on Guttadiaphot. Lotte Kürzel.—p. 71.
Physiology and Disorders of the New-Born and of Female Breast. H. Rossenbeck.—p. 78.

Fetal Birth Traumas and Their Treatment.—Liebmann shows that although skull depressions are usually caused by a narrow pelvis, fractures and paralysis are generally the result of extraction by the breach. It is of great significance that the injuries be recognized immediately for, if the proper therapeutic measures are taken, neither the functioning nor the further development becomes noticeably impaired.

Significance of Retroplacental Blood for Detection of Syphilis.—Hilden states that examination of the retroplacental blood always gave the same reaction as the venous blood gave on the seventh day of the puerperium. The result of Wassermann tests made during confinement was found just as reliable as the result of those made at other times. Nonspecific reactions were not observed, and the author thinks that the positive reactions during confinement and puerperium, which later disappear again, are reactions produced by a latent syphilitic infection. The diagnosis of syphilis should never be based on a single positive reaction. Every unexpected positive reaction during birth and the puerperium requires careful after-examination.

Sure Sign of Hypermaturity in the New-Born.—Roentgenologic examination of the wrist joints of the new-born convinced Szellö that those in whom signs of the os capitatum and of the os hamatum are detectable on the first day after birth are hypermature, for ordinarily these bones do not become visible until the second half of the first month of extra-uterine existence. This sign is valuable for forensic medicine, but since it is not detectable in utero it is not of value for determining the advisability of the artificial induction of labor.

Wiener Klinische Wochenschrift, Vienna

44: 1181-1208 (Sept. 18) 1931

Modification of Pressure in Right Ventricle by Respiration. R. Wagner.—p. 1181.
Operative Treatment of Acute, Profuse Gastric and Duodenal Hemorrhages. H. Finsterer.—p. 1185.
Hydropericardium During Hydronephrosis. P. Saxl.—p. 1188.
Form of Endocrine Arthralgia. L. v. Pap.—p. 1189.
*Subungual Tumors. D. Eisenklam.—p. 1192.
Clinical Results of Application of (Sexual) Cycle Hormone. A. Wicke.—p. 1193.
Diagnosis and Therapy of Diseases of Tracheobronchial Tree by the Bronchoscope. F. Haslinger.—p. 1195.
Tumors of Eye with Especial Consideration of Their Treatment. J. Böck.—p. 1199.
Period of After-Treatment Following Malariotherapy of Dementia Paralytica. O. Kauders.—p. 1199.
Pathogenesis of Chronic Inflammation of Gums and Cause of Odontoptosia. B. Gottlieb.—p. 1200.

Subungual Tumors.—Eisenklam points out that subungual tumors of the fingers and toes are often incorrectly diagnosed. Thus many patients have to endure severe pain for prolonged periods, and in other cases the life endangering significance of the tumor is recognized too late. After reporting several case histories he discusses the three types of subungual tumors; namely, the benign, the intermediate and the malignant forms. The benign forms are the exostoses that usually develop in young patients, the subungual fibromas that generally grow slowly and cause little pain, and rare forms such as osteochondromas, papillomas, leiomyomas and myxochondromas. The intermediate forms of tumors usually develop following a trauma. First there is a small blue spot underneath the nail,

which causes severe pain. Then a ledge-like protrusion develops in the nail, which by its livid color differs from the rest of the nail. Extirpation reveals a tumor about the size of a pea, which, although situated in a groove of the bone, involves neither the periosteum nor the bone. The surrounding tissues frequently show inflammatory changes, but this form of tumor does not metastasize. Among the subungual tumors of malignant character many resemble fibromas and angiosarcomas, and even the primary malignant melanoblastomas may, in their beginning stages, be mistaken for benign tumors. These growths usually originate in the pigment cells of the skin. Their pathologico-anatomic structure indicates that they are melanocarcinomas. They metastasize rapidly. Of especial interest is the fact that although the primary tumor is not pigmented it causes melanotic metastases. There are also subungual melanoblastomas that develop from a nevus. In the conclusion the author points out that most patients with subungual tumors suffer from intermittent pains. For this reason even the benign tumors should be removed as soon as possible. Especially deplorable are the cases of melanoblastomas that, because the nail, like a foreign body, causes suppuration, are diagnosed and treated as paronychia.

Zeitschrift f. Geburtshülfe u. Gynäkologie, Stuttgart

100: 201-424 (Sept. 11) 1931

*Roentgenologic Aspects of Sterility. G. K. F. Schultze.—p. 201.
Expert Testimony in Alimentation Lawsuits with Consideration of the Undersized Infant. B. Schweitzer.—p. 251.
Hemorrhages During Last Months of Pregnancy. V. Albeck.—p. 257.
Actinomycosis of Ovary. C. Fátyol.—p. 280.
Carcinoma of Vagina: Case. H. Hinselmann.—p. 288.
*Largest Number of Uterine Contractions During Spontaneous Confinement of Multiparas with Pelvis of Normal Width and with Exclusion of Premature Rupture of Bag of Waters. E. Frey and A. Meier.—p. 299.
*Largest Number of Labor Pains in Spontaneous Confinement of Multiparas with Pelvis of Normal Width but with Premature Rupture of Bag of Waters. E. Frey and M. Dressler.—p. 317.
Postclimacteric Hemorrhages of Benign Origin. K. Adler.—p. 343.

Roentgenologic Aspects of Sterility.—Schultze discusses contrast visualization of the female genitalia in its significance for the diagnosis, prognosis and treatment of sterility. First he discusses the roentgenologic aspects of the various obstructions and of other pathologic changes on the uterine tubes, and then the abnormalities of the uterus and of the cervix. In the conclusion he emphasizes that by limiting his treatise to the roentgenologic aspects of sterility he does not wish to overemphasize its significance or advocate its one-sided employment to the exclusion of other diagnostic methods. On the contrary, it should complement the other diagnostic methods, but it is not intended to replace them. In cases in which the cause of the sterility is clear, contrast visualization is not necessary and in other instances it is to be employed only after certain other examinations have been completed. However, in some cases roentgenoscopy reveals conditions that are not detectable by any other method and thus it permits individualization in the treatment.

Number of Uterine Contractions During Confinement of Multiparas.—Observations on 200 multiparas with normal pelvis, and in whom the bag of waters did not rupture prematurely, convinced Frey and Meier that the largest number of uterine contractions during the period of dilatation following rupture of the bag of waters is between 51 and 100. During the period of expulsion, provided the bag is ruptured, the number of contractions varies between 26 and 35. The total number of contractions during both periods following rupture of the bag of waters is between 101 and 150. If therefore in a multipara, following rupture of the bag of waters, the highest number of contractions for each respective phase has been reached without that period of the process of labor being completed, the condition is pathologic, the spontaneous delivery of a living child by the natural process cannot be expected, and an intervention becomes necessary. The authors think that if the labor pains are not counted the indications for the cesarean operation, for instance, are too indefinite.

Number of Labor Pains with Premature Rupture of Bag of Waters.—On 200 multiparas with prematurely ruptured bag of waters and with pelvis of normal width, Frey and Dressler investigated whether for the entire process of confinement and for its phases a maximum number of contractions can be determined within the limits of which spontaneous delivery may be expected without injury of either mother or child. They observed from 151 to 175 contractions for the period of dilatation, from 26 to 35 contractions for the period of expulsion, and for the entire process of delivery from 151 to 175 contractions. The authors think that the management of confinement should be expectant until the highest numbers of contractions have been reached, but after that intervention is necessary.

Zentralblatt für Gynäkologie, Leipzig

55: 2853-2920 (Sept. 26) 1931

*Sterility and Prevention of Conception. H. Knaus.—p. 2854.
*Cohabitation in Etiology of Puerperal Fever. J. Batisweiler.—p. 2858.
Cure of Carcinoma of Vulva by Operation and Irradiation with Subsequent Pregnancy. F. Heimann.—p. 2869.
Reduction of Mortality in Carcinoma of Cervix Uteri. P. Werner.—p. 2871.
Scarlet Fever and Cesarean Section. W. Müller.—p. 2873.
Congenital Malaria. N. Ter-Ossipian and P. Markarian.—p. 2879.

Sterility and Prevention of Conception.—Knaus maintains that in women, just as in most mammals, fertilization occurs at the time of the termination of the ovulation process. In a sexual cycle of several weeks' duration there is therefore a comparatively long period of physiologic sterility. In a healthy woman who menstruates regularly every twenty-eight to thirty days, ovulation takes place between the fourteenth and sixteenth days of the mensual cycle. On the basis of observations the author maintains that in such women the conception capacity is limited to the time between the eleventh and the seventeenth day. During the first ten days, and from the eighteenth day of the menstrual cycle, a physiologic sterility exists. The author thinks that abstinence during the time of the conception capacity is the only natural and also the most hygienic, ethical and esthetic method for the prevention of conception. In women with longer or shorter menstrual cycles the periods of conception capacity and also of physiologic sterility vary somewhat.

Cohabitation in Etiology of Puerperal Fever.—Batisweiler discusses the detrimental results that may be caused by cohabitation during pregnancy. He reaches the following conclusions: 1. During the first half of the period of gestation, cohabitation may cause hemorrhage and even abortion. It is therefore advisable, especially for primigravidas, to abstain from sexual intercourse at least during the first three months. 2. During the second half of pregnancy a too intensive sex life may cause either abortion or premature birth, especially if there is a predisposition for habitual abortion; however, under normal conditions cohabitation is without danger. 3. Toward the end of pregnancy, that is, from six to three weeks before confinement, cohabitation may cause premature rupture of the bag of waters, infection and puerperal fever. For this reason strict abstinence is necessary. 4. A cohabitation after labor pains have already set in may lead to fatal sepsis. 5. Coitus during the puerperium involves likewise the danger of fatal sepsis. Cohabitation should therefore not be resumed until the fourth or fifth week after confinement.

Vrachebnaya Gazeta, Leningrad

Sept. 30, 1931, number 18, pp. 1315-1394

Etiology of Tumors. N. N. Anichkov.—p. 1319.
Function of Blood in Respiration and Physicochemical Laws. G. E. Vladimirov.—p. 1327.
Etiology of Goiter. V. V. Savich.—p. 1332.
Atypical Forms of Epidemic Encephalitis. S. Gorodetskiy.—p. 1336.
*Insulin in Treatment of Pernicious Anemia. A. Yu. Lebedov.—p. 1340.
Acute Rheumatism in Nurslings. S. E. Levintova.—p. 1345.
Decompression by Trephination in Status Epilepticus. A. I. Krapivkin.—p. 1347.
Small Doses of Quinine in Treatment of Malaria. A. A. Solomin.—p. 1349.

Insulin in Treatment of Pernicious Anemia.—Lebedov describes his observations in the treatment of seven persons with pernicious anemia. Insulin was used to increase the appetite; this treatment was followed by a decided improvement in the patient's condition. In instances in which arsenic and iron

were ineffective, insulin produced an increase in the percentage of hemoglobin as well as an increase in the number of red blood cells and an improvement subjectively and objectively in the patient's condition. There was no influence on gastric secretion. In the cases in which the spleen was enlarged, the treatment led to a decrease in its size. The effects of insulin lasted not only during but after the conclusion of treatment. Secondary anemia conditions were markedly improved; but in pernicious anemia and in anemia without regeneration of erythrocytes there was a relapse within six months after treatment.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

75: 4751-4878 (Sept. 19) 1931

Sleep and Hypnotics. E. D. Wiersma.—p. 4752.
*Auto-Agglutination in Human Blood. J. van der Hoeden and A. G. M. Verbeek.—p. 4767.
Injury to the Eye Caused by a Crystal of Potassium Permanganate. G. W. Wisselink.—p. 4795.

75: 4879-4970 (Sept. 26) 1931

Bronchiectasis. G. J. van Thienen.—p. 4884.
Prophylactic Roentgen Irradiation After Operative Removal of Cancer of Breast. A. E. Nordholt.—p. 4892.

Auto-Agglutination in Human Blood.—Van der Hoeden and Verbeek state that in the serum and plasma of the blood of four patients with hypertrophic biliary cirrhosis, which blood was collected at body temperature (37 C., or 98.6 F.) they demonstrated the presence of a substance that at temperatures below about 25 C. (77 F.) caused auto-agglutination of the erythrocytes. The agglutination at these temperatures is reversible. In the microscopic preparation one observes that the erythrocytes first collect in short chains, which then, as the temperature falls further, are brought together to form larger conglomerates. Through saturation of the serum with suitable erythrocytes at temperatures above 25 C., the iso-agglutinins can be withdrawn, whereas the substance mentioned, which former researchers have termed "auto-agglutinin," remains present unchanged. Not only in the serum but also in the plasma, the auto-agglutinin remains stable in physiologic solution of sodium chloride for at least six months. It stands heating up to a temperature of 60 C. (140 F.) but at 65 C. (149 F.) it is lost. It is not soluble in ether and cannot be passed through a collodion membrane. With saturated ammonium sulphate it is precipitated out of the solution, but not with calcium chloride. It is thus fixed to the globulin fraction of the serum and not to the fibrinogen. The auto-agglutinin is filtrable through a Chamberland-Pasteur candle and a Seitz filter.

Hygiea, Stockholm

93: 625-656 (Aug. 31) 1931

*Liver Extract Suitable for Injection. Selander.—p. 625.
Occurrence of Strain Specific Immunity in Tertiary Malaria and Significance in Fever Therapy. B. Jacobowsky and N. Sahlström.—p. 630.

Liver Extract Suitable for Injection.—In four cases of pernicious anemia in which he used treatment by intramuscular injection of a suitable commercial liver preparation, Selander found the results equal to those following oral administration of liver.

93: 657-688 (Sept. 15) 1931

*Splenectomy in Essential Thrombopenia. Å. Grevilluis.—p. 657.
*Pneumothorax for Diagnosis of Cavern. R. Borelius.—p. 661.

Splenectomy in Essential Thrombopenia.—In Grevilluis's case of essential thrombopenia with rather acute course, with massive nosebleed as the main symptom, and with internal therapy ineffective, splenectomy, done at a stage when the patient was greatly exhausted, resulted in an immediate recession of all symptoms and after a couple of months the number of blood platelets was normal.

Pneumothorax for Diagnosis of Cavern.—Borelius presents two cases in which artificial pneumothorax, induced for diagnostic purposes, showed that a roentgenologically indistinct circular shadow was a cavern, and four cases in which pneumothorax, induced for therapeutic purposes, revealed the presence of caverns previously suspected or not visible. The result is due, he says, to the greater prominence after pneumothorax of the formerly indistinct circular shadows and to the shifting of the shadows, usually toward the hilus. This change of position constitutes the strongest evidence for an intrapulmonary (and not pleural) process. Since the pneumothorax is not wholly without danger, it is advised only when other methods fail, and it should not be applied in ambulant cases.

Nordisk Medicinsk Tidskrift, Uppsala

3: 561-576 (Sept. 5) 1931

Review of Toxicology of Use of Tobacco and Some Related Questions. Ulf v. Euler.—p. 561.
Has Tuberculosis Infection in Childhood Ever Been Generally Widespread? J. Heimbeck.—p. 567.
Remarks on Professor Holmdahl's Article "Tuberculosis and Crusade Against Tuberculosis." Sig. Magnusson.—p. 573.

3: 577-592 (Sept. 12) 1931

Virulence of B C G. K. A. Jensen.—p. 577.
*Problem of Pathogenesis in Megacolon. E. Ask-Upmark.—p. 581.

Problem of Pathogenesis in Megacolon.—Ask-Upmark concludes that the importance of mechanical obstruction in the pathogenesis of megacolon seems to have been exaggerated, while the conception of megacolon as a primarily congenital condition may have been undervalued. Morphologic malformation and functional abnormality in the neuromuscular apparatus of the intestine are regarded as important factors in the pathogenesis of megacolon.

3: 609-624 (Sept. 26) 1931

*Studies on Gastric Ulcer, Particularly with Regard to Nervous Symptoms. B. A. Boye.—p. 610.
Bronchial Asthmas, Illustrated by Invalidity Insurance Commission's 625 Cases. I. H. C. Gram.—p. 616.

Studies on Gastric Ulcer: Nervous Symptoms.—Boye's material comprises 937 cases of ulcer, partly established cases, partly cases with probable diagnosis of ulcer (about one third). He finds that the proportionate frequency of the condition in men and women is as 3 to 2. In both sexes the subjective symptoms, including nervous symptoms, show a tendency to increase as the objective ones decrease. In the group with numerous objective symptoms, men dominate; in the group with few objective symptoms, women. Nervous symptoms are common, especially in women.

Upsala Läkareförenings Förhandlingar, Uppsala

37: 1-213 (Sept. 21) 1931

*Septic Pleural Empyemas with Especial Regard to Late Results. E. Schildt.—p. 2.
*Case of Endometrioma with Localization in Round Ligament of Uterus. H. Marcus.—p. 207.

Septic Pleural Empyemas: Late Results.—Schildt reports 289 cases, without complications in the form of tuberculosis, actinomycosis or tumor, in which the patients were treated from 1916 to 1929. There was marked increase in the number of cases of empyema during the influenza years. About 50 per cent of the cases occurred in the first twenty years of life and about 70 per cent in the first thirty. Over 61 per cent were in the male sex. Etiologically about 85 per cent of the cases are ascribed to certain or probable pulmonary diseases. Streptococcus infection was the most frequent infection. Typical complications of empyema appeared in fifty-nine cases, with fatal outcome in about 60 per cent. Subperiosteal resection of the ribs or intercostal incision with open drainage was the chief method of treatment. After-examination was done in over 95 per cent of the cases. Permanent recovery for from more than one to over fourteen years was seen in 178 cases, or about 61.5 per cent of the total number. There was recurrence in 32 cases, or about 11 per cent, appearing within four years in 97 per cent of the cases; no recurrence was noted after five years. There were fifteen chronic cases, or about 5 per cent. Restored full ability to work after six months was seen in 80 per cent of the 178 cases. The total mortality was 18.6 per cent.

Endometrioma with Localization in Round Ligament.—Marcus's patient had had for two years a slowly increasing swelling in the right groin, without symptoms except a sense of weight and tension on menstruation. Examination showed a tumor-like formation of firm consistency about 3 or 4 cm. long and of the thickness of the little finger, situated corresponding to the course of the round ligament and attached to the pubic bone. The microscopic diagnosis following extirpation was adenomyofibrosis.